THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

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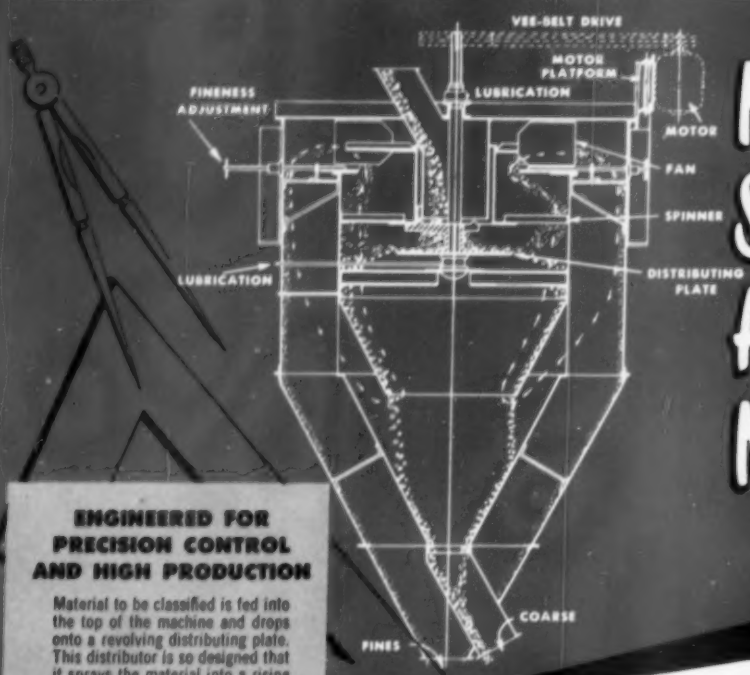
Portable crushing and screening units of Erie Stone Co., Bluffton, Ind.

MARCH 1956



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ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY — LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

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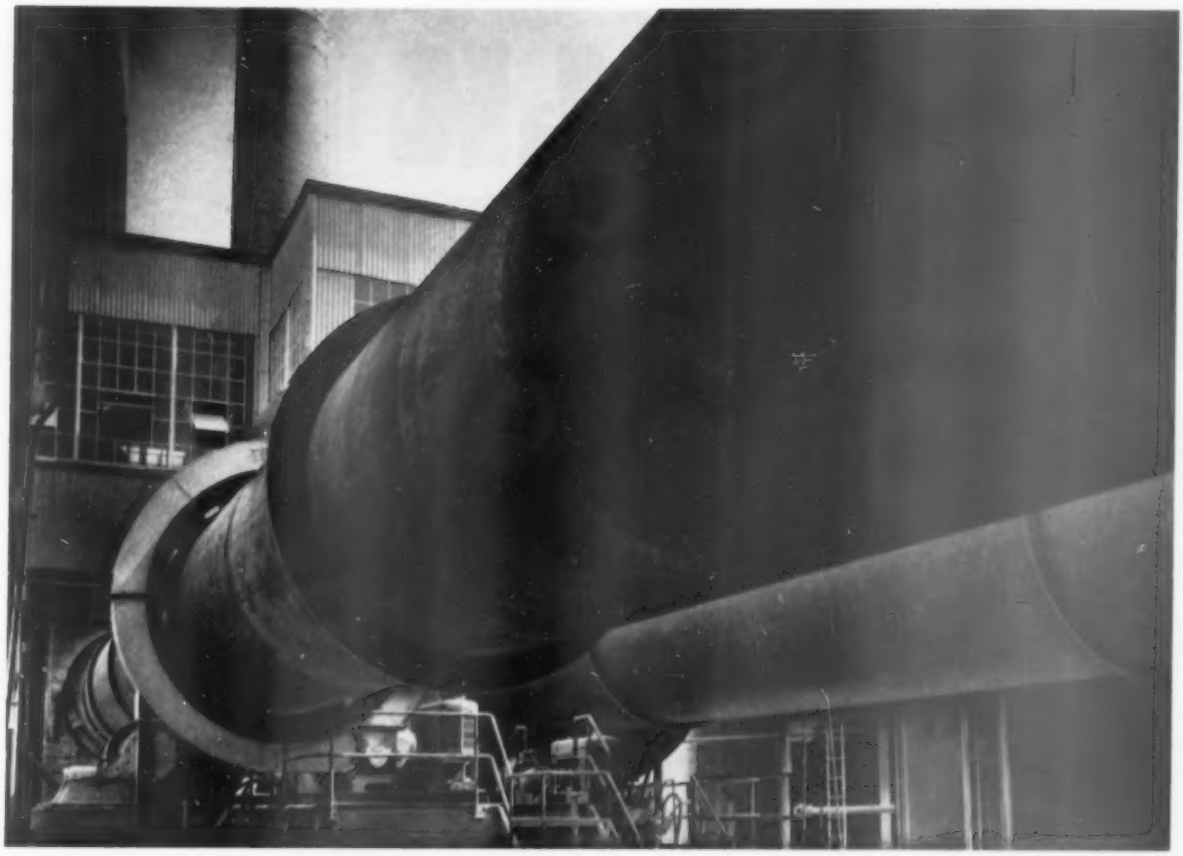

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Almost 10½ miles long

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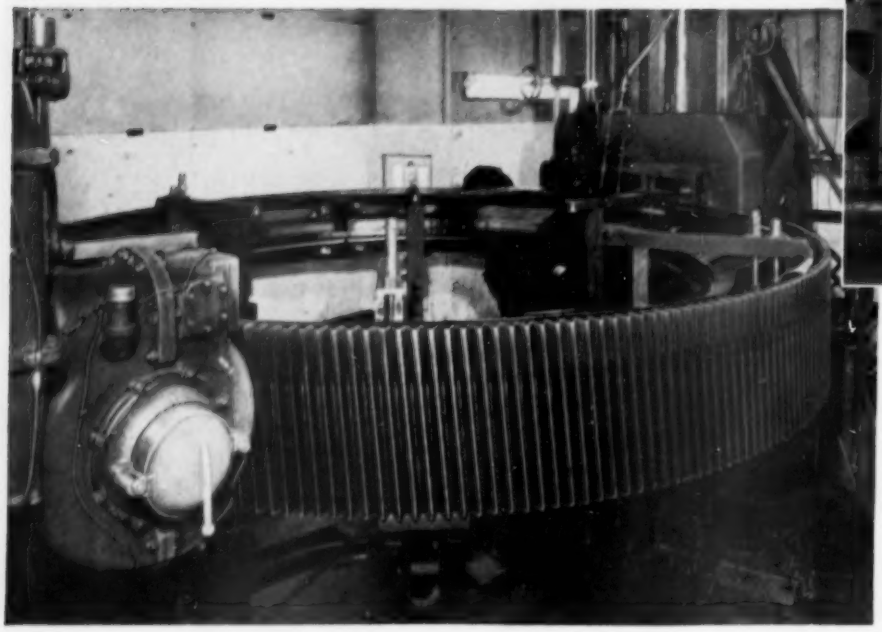

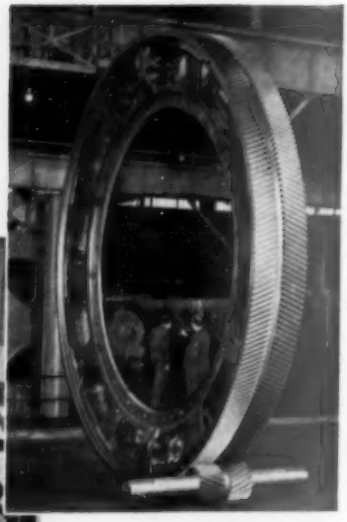

ABOVE: In foreground, split ring herringbone gear, 16¾ feet in diameter. In background, a single helical gear is being rough-cut on special hobbing machine (which also can cut herringbone or spur gears).

LEFT: Split ring gear receiving final cutting on special hobbing machine, designed and built by Falk. It is operated in a temperature-controlled room to minimize dimensional variations.

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• Are you making the mistake of driving your costly mills and kilns with gears of antiquated design—or with gears made to a price, rather than to the topmost standards your operation deserves?

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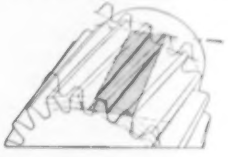
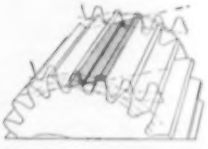
GEAR FACTS FOR ENGINEERS

The greater capacity of Falk Helical Gears, whose teeth are cut obliquely across face, is shown by the sketches below. When helical gears mesh, two or more teeth are always in contact; they share the load. Result: maximum contact area, greater capacity and strength.



By contrast, on gears with teeth cut straight across the gear face (as in spur gears), there are alternately one or two teeth in contact when gears mesh. Result: Very small contact area. The load-carrying capacity (rating) is determined by minimum contact conditions when but one tooth sustains the load.



On the basis of comparative sizes of contact areas of the two gear types, the high capacity of helical gears over competing types is apparent. Engineers, operators and maintenance men who have experienced the advantages of Falk Helical Gears are unwilling to "settle for less".

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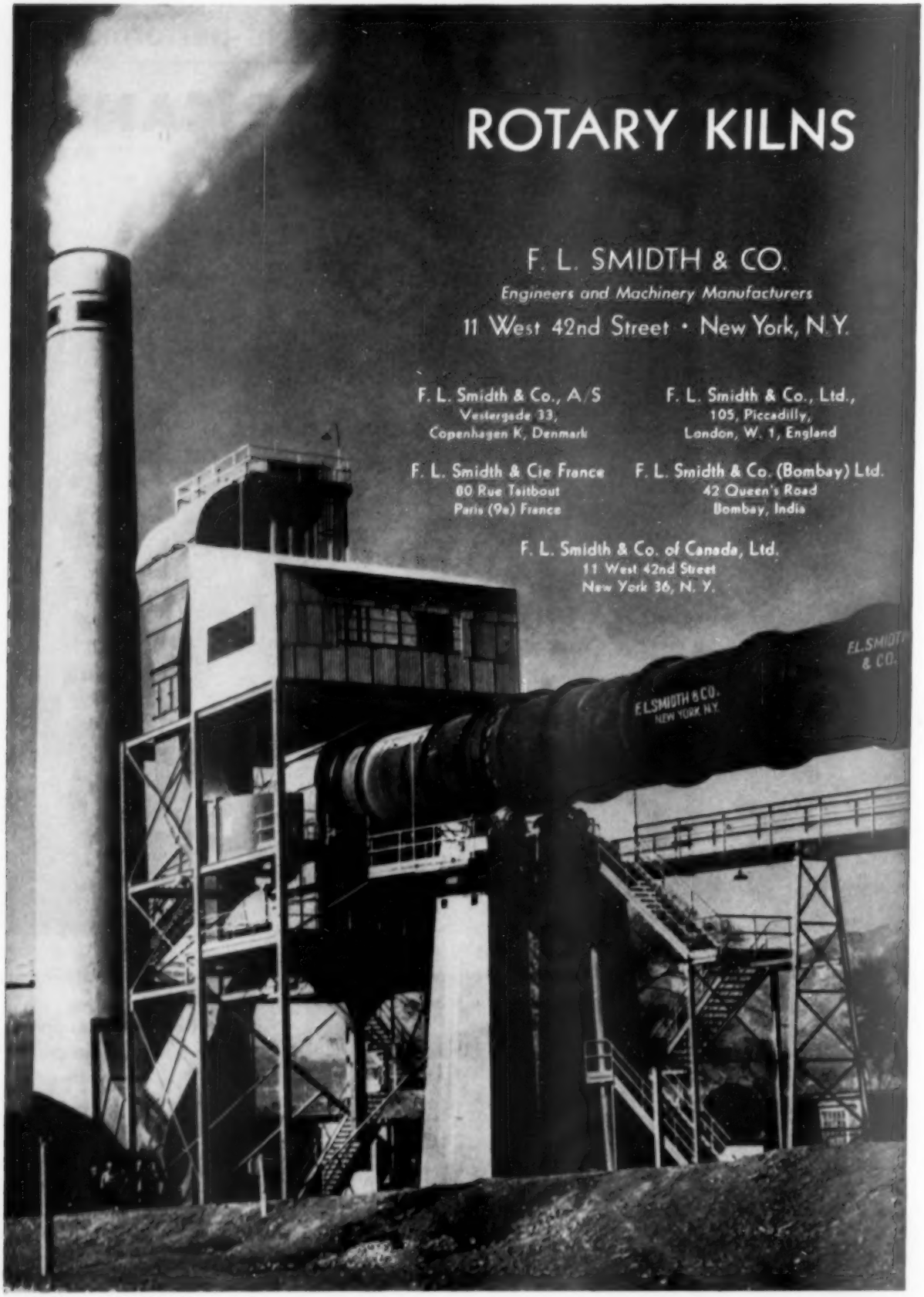
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What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

March, 1956

Backlogs of the nation's leading industrial engineering and building firms are bigger than at any time since the early part of the Korean war and 1956 is expected to be "one of the best years" ever experienced by this segment of the construction industry, according to T. C. Williams, president of National Constructors Association. The outlook for new business in 1956 is also good, according to Mr. Williams. With the exception of steel and cement, he said that construction materials are in sufficient supply to facilitate the prompt completion of most industrial projects in today's market.

Construction contract awards, in the 37 states east of the Rockies, totaled $23,745,277,000 for the 12 months of 1955, according to an **F. W. Dodge** report. The year's total was an all-time high, 20 percent higher than the 1954 total which was itself a record. The year 1955 was the 10th successive year of new record volumes. Non-residential building contracts for the year amounted to $8,496,829,000, up 19 percent over 1954; residential contracts totaled $10,185,259,000, up 20 percent; and heavy engineering awards totaled $5,063,189,000, up 22 percent.

Payment of at least operation and maintenance cost of navigation facilities supplied by the federal government has been recommended in a report of the Presidential Advisory Committee on Water Resources Policy. In its discussion of navigation, the committee stated that "serious consideration should be given to repayment of a portion of the cost of new navigation projects, particularly those which will create navigability where none now exists, by the institution of user charges."

A "ceramic" paving material has been developed by Emmet Poston of Springfield, Ill., which has been tested by the United States Navy, and was reported to support more than the 50,000-lb. weight impact per wheel required by the Navy. The pavement is claimed to be impervious to weather, requires no expansion joints for heat expansion, and is said to be undamaged by the heat built up by warming up jet airplanes.

About 1,465,000 long tons of new crude and man-made rubber will be consumed by the United States in 1956, and at least 62 percent of the total will be American-made rubber, according to a report by the B. F. Goodrich Co. Production and sales of rubber products during 1956 are expected to approach levels almost as high as those reached in 1955, the record year for sales in the rubber manufacturing industry.

Advance notice of mergers and advance approval by the Federal Trade Commission or the Justice Department are being recommended by Celler's House Judiciary Committee. Broad merger blocking powers for the F.T.C. have been proposed.

Convictions of labor officials increased in 1955, under the Hobbs Anti-Racketeering and the Taft-Hartley Acts, the two main laws the government uses to fight labor racketeering. The total of 53 convictions in 1955 was nearly double the number for the previous year. The Hobbs Anti-Racketeering Act, the tougher of the two statutes, makes it a felony for a union representative to demand money for his own personal use through threats of "labor trouble." Past convictions have upheld the government's contention that if a victim is put in fear of economic loss by such threats, it comes under the meaning of extortion in the Hobbs act and makes the accused liable to a jail term of up to 20 years and a fine up to $10,000. The Criminal Division of the Justice Department also said it had seven convictions in 1955 against labor representatives for violations of criminal tax statutes. This is the third weapon often used by the department against labor racketeering.

Heavy construction awards, nationally, totaled $1,592.8 million for the month of January, 1956, which was 23 percent higher than in January, 1955, and 5.5 percent higher than the previous January, 1953 record, as reported in **Engineering News-Record.** Private awards of $866.8 million were 8 percent ahead of a year ago, despite a 16 percent decline in private mass housing awards. Public projects of $726.0 million set a new record for the month, 48 percent above a year ago.

A hog fat chemical is being used experimentally as a waterproofer in the base of highway pavement in Indiana to keep water from seeping under the pavement and breaking it up in freezing weather. State Highway Commission engineers believe a similar substance may be made from corn starch. Experimental highway strips include 400 ft. on Indiana 42, and 900 ft. on Indiana 243.

Burglars using an acetylene torch made an unsuccessful attempt to open the steel door to a vault of a gravel firm in Iowa. Although they succeeded in cutting a hole in the door, they failed to get it opened, but did start a fire in records stored in the vault, and caused extensive damage to the office. A money box, containing between $50 and $60 was missing from the office, and the total loss and damage amounted to approximately $1000.

American railroads spent about $890 million in 1955 on plant and equipment to maintain their plant in top operating condition. This was an increase of more than $70 million over the amount spent in 1954, and brings the railroad's total expenditures to approximately $11 billion since the end of World War II.

More people applied for F.H.A.-insured mortgage loans in 1955, than in any previous year, with an estimated total of 615,000 applications, according to Norman P. Mason, federal housing commissioner. A prime factor in the unprecedented demand, as stated by the commissioner, was record activity in the market for existing homes, spurred by the most helpful government housing program in history.

Two magnesium metal plants at Freeport and Velasco, Texas, owned by Dow Chemical Corp., New York, N. Y., are operating at full capacity of 70,000 tons annually. This is the first time these plants have run at full capacity for several years. The chemical firm is "building up inventories in anticipation of increased demand."

THE EDITORS

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at 100 rpm slower speed (1700 instead of 1800 rpm)

it delivers 50 cfm more air (365 instead of 315 cfm)

THE JAEGER "365" ROTO AIR-PLUS®

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EDITOR'S PAGE

The Highway Program is Yet to be Determined

ALL THE RECENT PUBLICITY RELEASES on prospects for passage of an accelerated federal-aid highway building program in the present session of Congress are favorable that adequate legislation will be enacted. The result is a tendency for interested individuals to be over-confident and take for granted that action will soon be taken, whereas legislation on highways actually is now in a critical stage of consideration.

Many things can happen where there are so many divergent views with respect to scope of the program and its financing, so it would be well for all who have a stake to accelerate rather than lessen their efforts to present facts that have bearing in the right places.

The administration's approval of major provisions of the Fallon highway authorization bill is a step in the right direction and represents a major meeting of minds that will have weight in the House, but there remain many opposing forces to endanger the passage of legislation.

As an example, the Boggs "Highway Revenue Act of 1956," presented before the House on February 6, which set up a program for financing road construction, and which met with considerable approval, stirred up opposition immediately after the bill was presented.

The Boggs bill was in line with the Fallon proposal which would pay for highway building through user taxes on a pay-as-you-go basis. There would be increases in federal motor fuel taxes and excise taxes for tires along with some new levies. The bill was estimated to yield $12.2 billion over a 15-year period. This total, along with the $22 billion anticipated from existing taxes, is expected to go a long way toward meeting the $36.5 billion federal spending for highways over a 15-year program, which the democratic party is pushing.

Differences to be Resolved

After this bill was introduced, objections were raised from some sources that insufficient funds would result. And, according to reports, automobile organizations set out to reduce the taxes on passenger automobiles and increase those to be levied on trucks.

We cite this by way of example that the stage is set for a series of obstacles, any one of which conceivably could defeat a highway program. It would seem that all is favorable for an adequate highway bill but there exist pressures from many opponents of the various proposals under consideration, to gang up and defeat anything but the normal two-year extension of federal aid available under present authorization.

There will have to be skilled management of the highway bill through Congress and many compromises will be required in order to come up with anything like a decent, well-balanced highway building program. It is emphasized that while there is indication of much progress, many differences of opinion exist that remain to be ironed out during this Congress.

Many national organizations have pooled their efforts to reconcile differences in thinking, and these combined efforts have served to alert Congress to the widespread feeling in favor of a good, accelerated highway construction program. They have lent support along the lines of most agreement, which is effective in bucking the efforts of organized minorities which can scuttle any important bills.

As it stands now, there is considerable agreement among the aggregates industries and other related groups that a well-balanced program be adopted. The federal share for the interstate highway system would be ninety percent of the cost. Funds for the primary and secondary federal-aid systems would be matched equally by the states and the federal government, and the states would build such roads under the administration of the Bureau of Public Roads. There would be no encroachment on the states' responsibilities.

Contact Officials

We make these points to emphasize that producers should continue and accelerate their efforts to get important facts across to their congressmen and senators. These men must be filled with information, whether they be on the congressional committees involved or not. Leading highway officials must also be kept informed.

Not only should effort be intensified to insure a program but to get the kind of a bill desired. There are dozens of bills under consideration now, with wide differences in their good and bad features. The goal should be one with as many desirable features as possible.

The amounts of money to be allocated as between the three federal-aid systems vary widely in the different proposals and the outcome will have important bearing insofar as these industries are concerned. Primary and secondary roads, and farm-to-market roads could well be neglected if efforts are not successful in gaining a well-balanced program. The time to act is now because this is an election year and thinking from home will have weight.

Bror Nordberg

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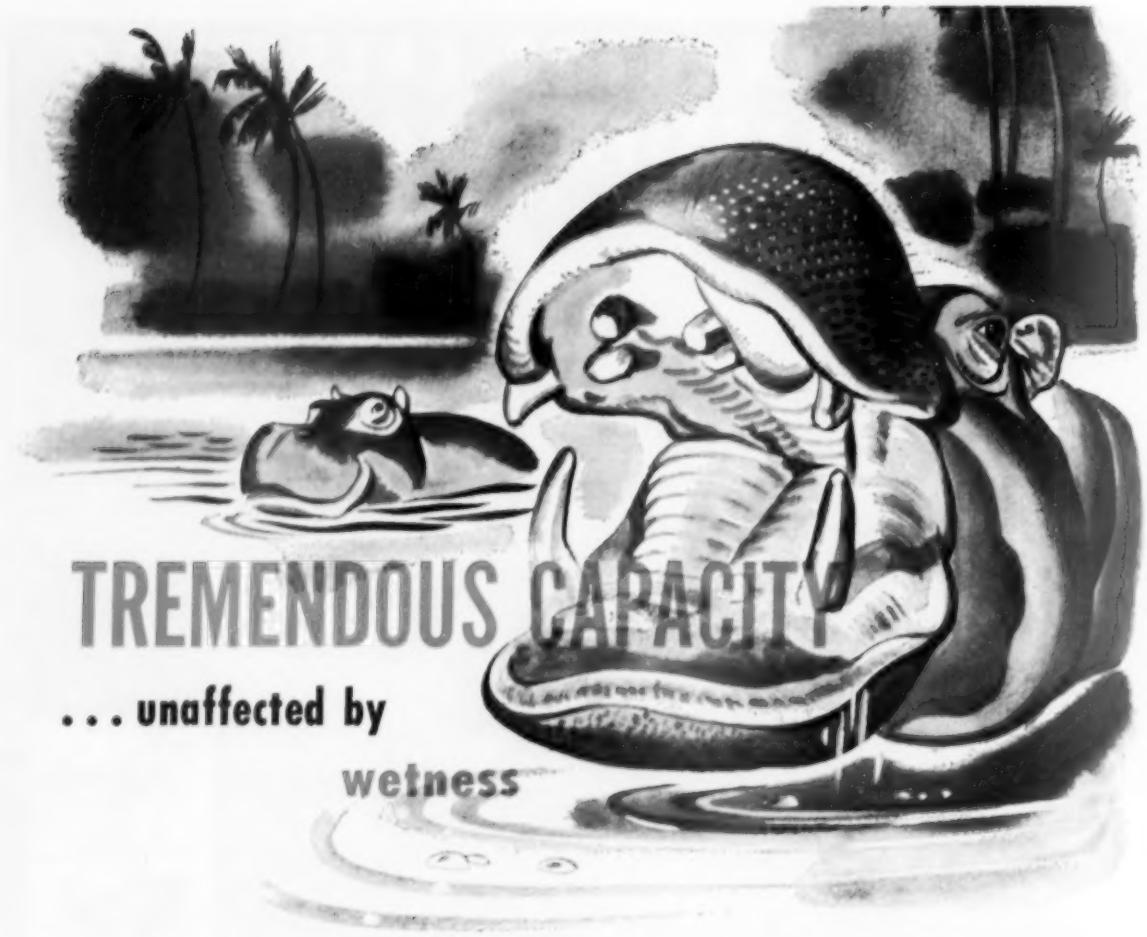

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ROCKY'S NOTES

NATHAN C. ROCKWOOD

WE EXPECT THIS to be the last of a series of reviews based on the papers delivered at the Third International Symposium on the Chemistry of Cement, London, England, 1952.* It reviews a fairly important paper and discussion on the subject of portland-slag and slag portland cements, a subject that has received very little attention in this country. So far as we are informed but two or three American cement manufacturers make such cements; and judging by rather acrimonious discussions at one time or another in Committee C-1 on Cement, A.S.T.M., there is considerable, if somewhat concealed, opposition to their production, exploitation and use in this country. There is no apparent reason why they cannot be made since blast-furnace slag is readily obtainable in various parts of the country at costs that seem to be less than the costs of producing portland cement clinker.

Nature of Slag Cements

A portland-slag cement is similar in most respects to a portland-pozzolan cement — slow hardening and slow in developing ultimate strengths, but reputed to be more durable under certain conditions that cause fairly rapid deterioration of ordinary portland cement concrete. Slag is not defined as a pozzolan because most slags, granulated and subsequently pulverized, show some hydraulic cementing properties of their own, while of course true pozzolans do not. However, slag is used for the same purpose as pozzolans — for reacting with the excess calcium hydroxide in hydrated cement, because slag like some pozzolans, is composed largely of silica and alumina in a reactive form — in the case of granulated slag mainly as a glass.

The paper we have special reference to is by Dr. F. Keil, of Forschungsinstitut der Zement Industrie, Germany, entitled merely "Slag Cements." In introducing his subject our author says: "There has been a general rise in the production of slag cements in the past few years for the following reasons. The addition of slag provides the possibility of economizing in coal; and the use of these cements has proved advantageous for mass structures or constructions which are exposed to sulphate-bearing waters, such as sea water. Slag cements, compared with portland cements, have lower early strengths and correspondingly a slower development of hydration heat which makes them suitable for mass structures but more sensitive to low temperatures."

Chemical analyses of blast-furnace slags usually show about 40 percent of silica plus alumina to 50 percent of lime plus magnesia, with the other less than 10 percent as iron, sulphur, moisture and alkali impurities. Hence, they are not very different from portland cement clinker except in the relative proportions of lime and argillaceous ingredients. Pulverized granulated slags are "activated" to become hydraulic cements by hydration and mixture with lime, or portland cement which in hydrating releases lime, or by other alkaline materials such as sodium and potassium hydroxides or carbonates. Calcium chloride, $CaCl_2$, also has an activating effect, evidently because it releases calcium ions to help form silicate and aluminate gels in the hydration of the slag. The alkalies are not used for this purpose on a commercial scale because some of the silicates formed are soluble and cause efflorescence or help promote rusting of the reinforcement. However, the slags themselves usually contain more alkali than the portland cement clinker they are used with.

Testing Slags for Hydraulicity

Dr. Keil describes in considerable detail various methods that have been proposed for testing slags for suitability as components of portland-slag and slag-portland cements. This distinction between two kinds of slag cement has been made in Europe, although there has been no occasion to do so in this country as yet. A portland-slag cement is roughly defined as one with 65 percent or more portland cement and a slag-portland cement as one with 50 percent or more granulated slag. In Europe the distinction in name is not important because the ultimate product is sold on a strength specification, without regard to composition, and the manufacturer may use as much slag as he can and still meet the specification.

The chief aim of testing slags for use with portland cement appears to be to determine the hydraulic properties of the slag by itself through laboratory experiment, by chemical analysis, and by microscopical examination. The experimental method of course takes a long time. The chemical method results in calculation of an hydraulic index, based chiefly on the proportions of silica and alumina to lime and magnesia. The larger the percentage of lime the better the hydraulic cementing properties of the slag, as would be expected since then the nearer it approaches cement clinker in composition. The microscope is used to determine the percentage of glass in the sample, since the part of the slag that is crystallized by slow cooling is considered useless for the purpose.

Role of Magnesia

There is a difference of opinion as to whether the magnesia should be counted in whole as only as one-half the value of lime in the formula. That opens a subject of the most current interest to American cement manufacturers and users because of the controversy as to the possible harm that may result from using a slag relatively high in magnesia. This question has caused considerable difference of opinion in recent meetings of Committee C-1 on Cement of the American Society for Testing Materials. The present A.S.T.M. specification for portland-slag cement limits the MgO content to not over 5 percent in the blended cement, as in the standard specification for any portland cement. This means, of course, that under ordinary conditions the slag itself must not contain much more than 5 percent MgO.

In view of the literature on this point cited in this paper, and European experience, it would appear difficult to maintain a position that no slag should be used that contains by chemical analysis more than about 5 percent of MgO. The reason is that there seems to be ample proof that MgO is not harmful in cements, or lime mortars, unless it exists as hard-burned MgO or periclase. In his book "The Chemistry of Portland Cement," Dr. R. H. Bogue has made it clear why an excess of MgO is harmful in portland cement clinker. As long as there is sufficient lime present in the raw mix to form $2\ CaO \cdot SiO_2$ the MgO will not combine with the silica or alumina except when as a liquid it is quenched to form a glass. If not supercooled in that form MgO separates out as crystals of periclase. Since all port-

(Continued on page 122)

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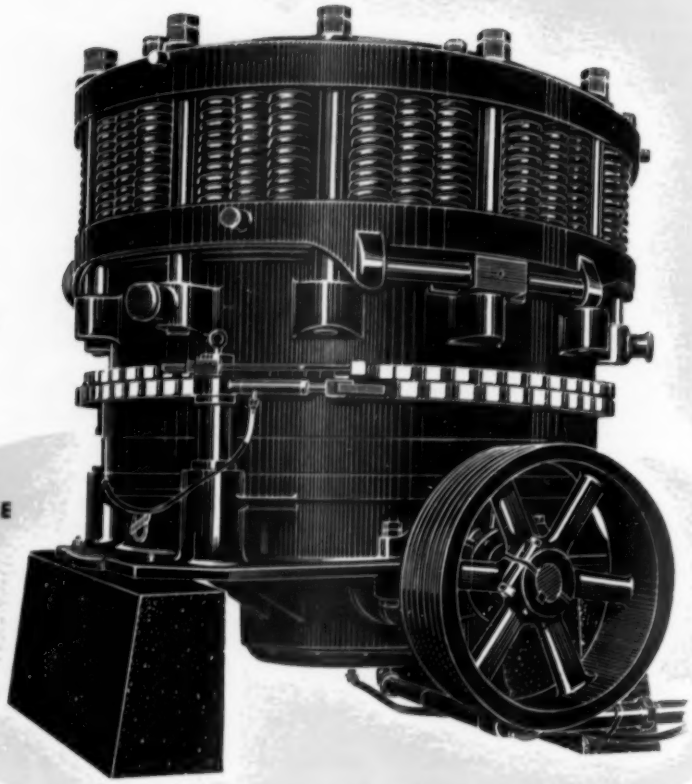

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LABOR RELATIONS TRENDS

By NATHAN C. ROCKWOOD

Sand and Gravel Haulers Squeezed Out of Contract by Union

SOME FINE POINTS in regard to a union's possible violation of National Labor Relations Act, Sec. 8 (b) 2, in attempting to force an independent hauling contractor to hire truck drivers only through the local union, were brought out in a decision of the National Labor Relations Board, December 28, 1955. In spite of the fact that the Board found the union in violation of the law in its contract with the general contractor, it was found not in violation of the law in causing a trucking contractor to discriminate in his hiring of truck drivers. The interesting reasoning by the Board involves a technicality that our readers should know about.

Facts in the Controversy

The case arose over a trucking contract given by the Donald M. Drake Co., associated with the George A. Fuller Co., to Harry Griffin, doing business as Harry Griffin Trucking, for hauling concrete materials from the Columbia Sand and Gravel Co. in connection with a construction job at Larson Air Force Base, near Seattle, Wash. Rather than comply with certain requirements of the local union's contract or to pay certain dues to the local union, the employer Griffin, was forced to give up his contract and discharge his drivers. However, the Board found the union not guilty of compelling the employer to discriminate against his drivers who were members of other locals, because he did not compel them to meet these demands to the local on the job, or otherwise to obtain "clearance."

Under a contract entered into in November, 1954, between the Drake-Fuller company and Griffin he agreed to haul all concrete-making materials from source to a batching plant on the job site. The Drake-Fuller company agreed to pay Griffin's truck drivers and deduct the sums from the amount due Griffin under the contract, but the drivers remained employes of Griffin with his right to hire and fire.

The local union of teamsters, chauffeurs, etc. had no contract with Griffin, but they did have one with the general contractor, more or less typical, which required the contractor to hire his truck drivers through local union channels. They attempted to compel Griffin to submit to the same contract terms; there was even a clause in the contract with Drake-Fuller Co. that sub-contractors must become parties to it. The N.L.R.B. held this condition "without merit." On Griffin's refusal, and the union's refusal to give clearance to his employes, an attempt was made to prevent him and his employes from working on the job.

The particular clauses of the contract involved hiring all employes through the local union and making payments to the local's health and welfare fund for each such employe so hired through the local. From here on is the text of the N.L.R.B. report.

"We agree with the Trial Examiner's finding to the effect that the Respondent [Teamsters' Union] violated Section 8 (b) (2) and 8 (b) (1) (A) of the Act by following the unlawful practice * * * of requiring applicants for employment as truck drivers to obtain clearance from it as a condition of employment, and by its efforts to induce Griffin to subscribe to this unlawful hiring practice, thereby attempting to cause Griffin to discriminate against employes in violation of the Act.

"The Trial Examiner found that the Respondent caused Griffin to discriminate against 11 of his key men named in the complaint, as amended in violation of Section 8 (b) (2) and 8 (b) (1) (A) of the Act. The Respondent excepts to this finding. We find merit in the exceptions.

"The Trial Examiner's ultimate conclusion on this aspect of the case is based upon his subsidiary findings that the Respondent refused to clear Griffin's key employes and thereby caused Griffin to abandon his contract with Drake-Fuller, all of which resulted in loss of employment to the employes in question. We would agree with the Trial Examiner here if, for example, the record showed that, pursuant to an illegal hiring practice between the Respondent and Griffin such as existed between the Respondent and other employers, employes were denied clearance by the Respondent and consequently suffered a loss of employment with Griffin or that Griffin, although not a party to any illegal hiring practice, chose to abandon his contract with Drake-Fuller, thereby depriving his employes of further employment, rather than operate with employes whose employment was objected to by the Respondent. But such evidence is not to be found in the record.

"Instead, the record shows that Griffin was not a party to any illegal hiring practice and that, acting through his foreman Shipp, he was willing that his key employes work without clearance from the Respondent and, together with Lile, a representative of Drake-Fuller, sought to persuade them to work without such clearance. It was only after these requests to work without clearance were rejected by the employes for the reason that they did not wish to jeopardize their status with the Respondent, and Griffin unsuccessfully attempted to obtain the clearance without which his key employes would not work, that Griffin abandoned his contract with Drake-Fuller. On these facts, it is plain that, were Griffin before us at this time charged with unlawful discrimination against the complainants in question, a finding would have to be made that he in no way discriminated against any of them during the period covered by the complaint. It therefore must be found that the Respondent did not cause Griffin to discriminate against those employes, in violation of Section 8 (b) (2) and 8 (b) (1) (A) of the Act. Accordingly, we shall dismiss those allegations of the complaint."

"Order: Cease and desist from maintaining unlawful job referral practice; causing or attempting to cause Harry Griffin Trucking or any other employer over whom Board would assert jurisdiction to discriminate against employes; restraining or coercing employes of any such employer in the exercise of their self-organizational rights. Post notice.

"Complaint is dismissed in so far as it alleges violations of Act different from those found in this decision and order. (As no exceptions were taken to trial examiner's finding that union did not violate Sec. 8 (b) (4) (A) of Act as alleged in complaint, that finding is adopted without comment.)" In other words, the matter of the Union's violation of the Act as regards Drake-Fuller was not the issue before the Board.

Ohio C. of C. Director

C. PAUL PALMER, president, National Lime and Stone Co., Findlay, Ohio, has been appointed a director of the Ohio Chamber of Commerce to represent natural resource production.

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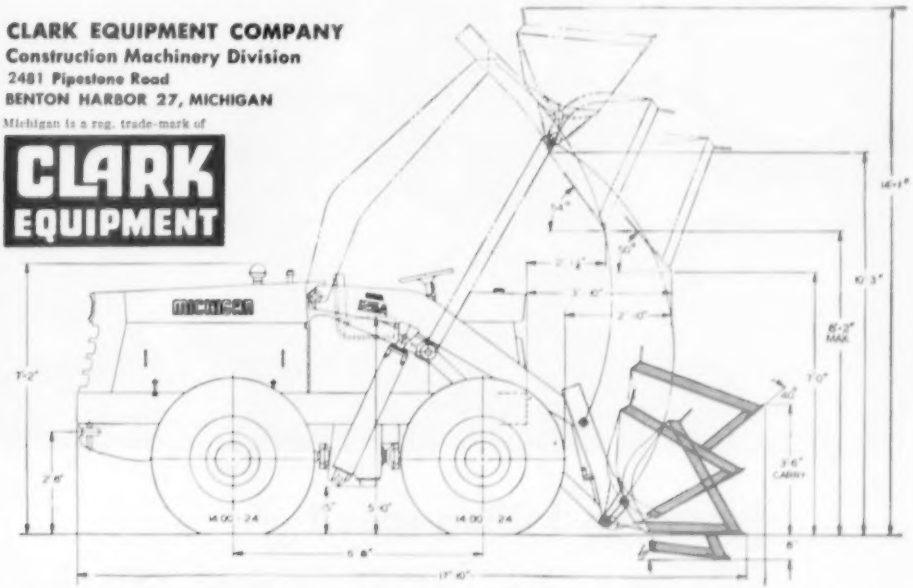

Multi-position Bucket Action: note the shaded area of this Model 125A range chart. From 8 inches below ground-level, two big double-acting bucket cylinders pull the bucket back to a 40-degree carrying position at a height of only 3½ feet. The operator has precision control over this independent bucket action.

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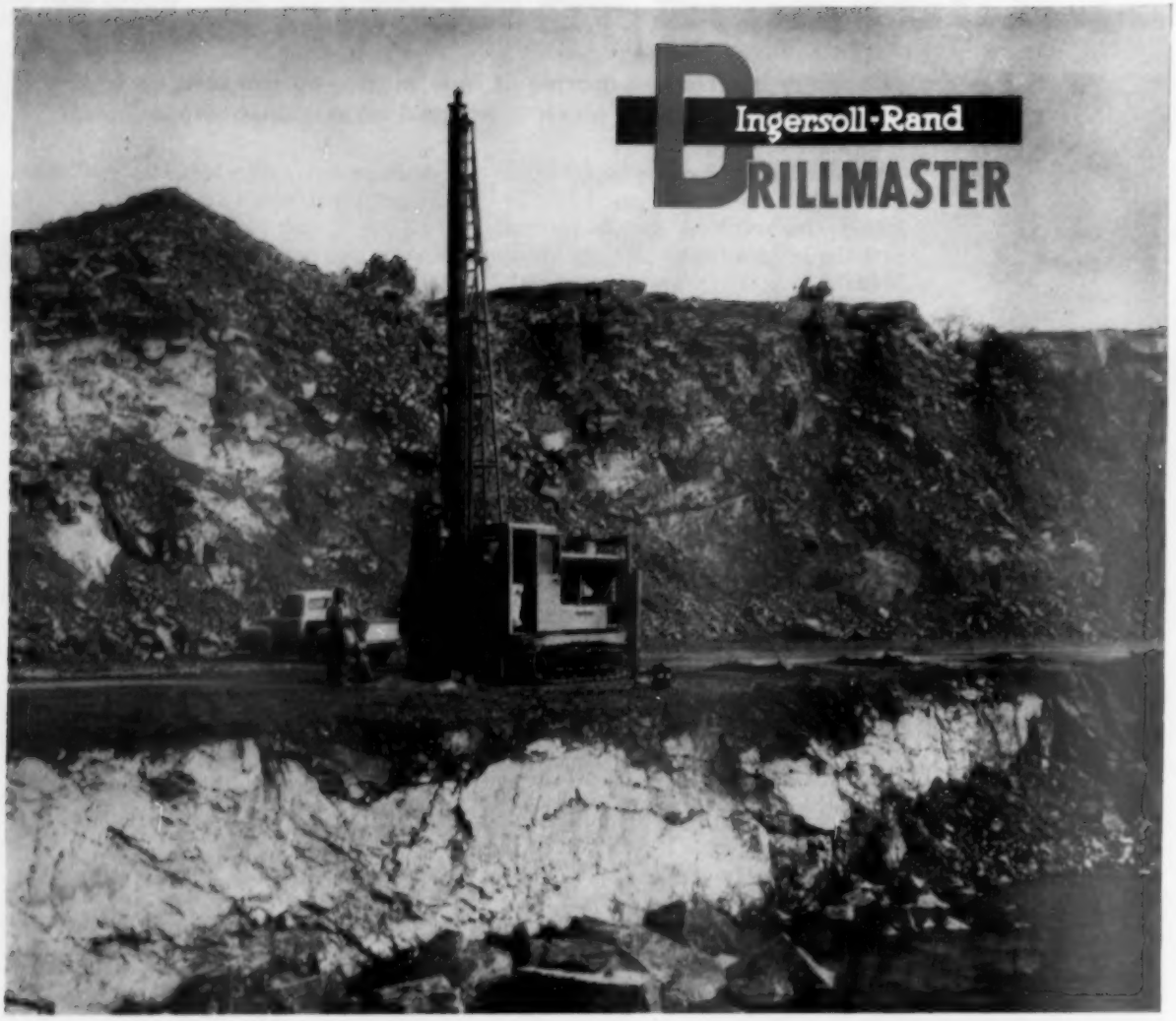

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PEOPLE
IN THE NEWS

Lehigh Plant Manager Retires

RAYMOND A. MORITZ has retired as plant manager of the Fogelsville, Penn., plant of Lehigh Portland Cement Co., Allentown, Penn., after 52 years of service. He will be succeeded by John L. E. Kratzer, who has been serving as assistant plant manager. Mr. Moritz started his career with Lehigh at the Ormrod, Penn., plant as a hoop maker when he was 13 years old. A few months later he became an apprentice in the machine shop. In 1907, when the Fogelsville plant was built, he transferred to the machine shop there and became foreman in 1911. He advanced to master mechanic of the plant in 1915 and became plant manager in 1917.

Re-elected M.M.A. President

ROBERT MITCHELL, president, Consolidated Rock Products Co., Los Angeles, Calif., has been re-elected president of the Merchants and Manufacturers Association in Los Angeles. Prior to his previous one-year term as president, Mr. Mitchell served two years as a vice-president of the association. L. E. Bancroft, executive vice-president, California Portland Cement Co., Los Angeles, was elected a director of the association for a two-year term, and Robert B. Coons, vice-president, American Potash and Chemical Co., was re-elected a director of the association.

Vice-president and Secretary

WILLIAM MARKS has been named vice-president and secretary of Permanente Cement Co., Oakland, Calif. He is also a director, vice-president, secretary and assistant treasurer of the Henry J. Kaiser Co.; a director, vice-president and secretary of Kaiser Aluminum and Chemical Corp.; a director, vice-president and secretary of Kaiser Steel Corp.; and an officer in many of the other Kaiser affiliated companies. Mr. Marks joined the Kaiser organization in 1942 and has been an officer of Permanente Cement Co. since 1951. He was born in Los Angeles, was graduated from Stanford University and obtained his law degree from the University of Southern California.

William Marks

Assistant to President

TED J. GUTT, formerly general manager of the Texas Stressed Concrete Corp., has been appointed assistant to the president of George Rackle & Sons, Cleveland, Ohio. A native of Cleveland and a graduate of the University of Rochester, N. Y., Mr. Gutt has been one of the pioneer consulting engineers and designers in the prestressed concrete field. He had a part in designing the first two prestressed concrete bridges in this country, the Walnut Lane bridge in Philadelphia and the Arroyo Seco bridge in Los Angeles.

Superintendent Retires

J. A. FAIRCHILD has retired as superintendent of the Bonner Springs, Kan., plant of Lone Star Cement Corp., New York, N. Y., and will be succeeded by John Lape, who has been serving as assistant superintendent. Born in White Haven, Penn., Mr. Fairchild started his career in the cement industry with the Missouri Portland Cement Co. as assistant chemist. He went to Bonner Springs, Kan., in 1923 as chief chemist and later was made superintendent.

Penn-Dixie Appointments

RICHARD P. SCOTT has been appointed chief engineer of Penn-Dixie Cement Corp., Nazareth, Penn. He was formerly operating assistant and will be succeeded in this position by John H. Jones, who has been superintendent at Plant No. 4, Nazareth, Penn., since 1954. Michael B. Hoffner, formerly plant engineer, succeeds Mr. Jones as superintendent at Plant No. 4. Omar J. Glantz has been named superintendent at Plant No. 10, Petoskey, Mich., replacing Fred B. Tripp who has resigned. Billy B. Nall succeeds Mr. Glantz as superintendent at Plant No. 2, Clinchfield, Ga.

Mr. Scott, a graduate mechanical engineer from the University of Kansas, Lawrence, Kan., started his career in the cement industry in the engineering and production departments of the Universal Atlas Cement Co., where he served for 15 years. He was manager of the manufacturing research division of the Portland Cement Association from 1945 to 1947. He served for five years as superintendent of the Toledo plant of Medusa Port-

Richard P. Scott

John H. Jones

Michael B. Hoffner

Omar J. Glantz

Billy B. Nall

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land Cement Co. before joining Penn-Dixie in 1953 as operating assistant.

Mr. Jones joined Penn-Dixie as a student engineer in 1948, subsequently becoming engineer-draftsman and then plant engineer at Plant No. 6. He transferred to Plant No. 2, Clinchfield, Ga., in a similar capacity, and later became superintendent. He has served as superintendent at Plant No. 4, Nazareth, Penn., since 1954. He was graduated from Lehigh University, Bethlehem, Penn., as a mechanical engineer.

Mr. Hoffner is a graduate in civil engineering from Michigan State College, East Lansing, Mich. He was associated with Medusa Portland Cement Co. before joining Penn-Dixie in 1952 as engineer-draftsman. One year later he was appointed plant engineer at Plant No. 4, Nazareth, Penn.

Mr. Glantz joined Penn-Dixie in 1953 as plant engineer at Plant No. 2, Clinchfield, Ga. In 1954 he was appointed superintendent at the plant. A graduate chemical engineer from the University of Denver, Mr. Glantz served as head of the cement unit of the U. S. Bureau of Reclamation prior to joining Penn-Dixie.

Mr. Nall, after serving two years in the U. S. Navy, joined the company as plant engineer in 1949 at Plant No. 1, Kingsport, Tenn., serving in that capacity until 1954 when he was placed in charge of developing the quarry operation at Speers Ferry, Va. He is a mechanical engineering graduate of the University of Kentucky, Lexington, Ky.

John R. Dwyer Retires

JOHN R. DWYER has retired as technical assistant of Committee C-1 on Cement, American Society for Testing Materials, after 35 years of service. He is also retiring as head of the Cement Reference Laboratory at the National Bureau of Standards, with which he has been associated for 26 years. Mr. Dwyer will continue to be connected with activities of Committee C-1, which has conferred upon him an honorary membership, and will also serve in an advisory capacity for a period of time with the Cement Reference Laboratory.

Concrete Board Chairman

P. H. RICE, technical director, American Concrete Institute, Detroit, Mich., was elected chairman of the Concrete Improvement Board of Detroit at a recent meeting of the Board, and R. L. Freeman, Huron Portland Cement Co., was elected secretary. Other members of the board include C. A. Sirrine, Concrete Products Association of Michigan, to represent the concrete products industry; W. G. Irmscher, Peerless Cement Corp., to represent portland cement manufacturers; R. S. Evans, American Aggregate Corp., to represent aggregate producers; and John Tucker, Ready Mix Concrete, Inc., to represent ready-mixed concrete producers.

Marietta Officers Re-elected

FRANK L. CHRISTY has been re-elected president of Marietta Concrete Corp., Marietta, Ohio. Other officers and directors re-elected are: F. Leonard Christy, vice-president in charge of sales; R. Neil Christy, vice-president in charge of engineering; Charles D. Fogle, secretary; Charles B. Ross, vice-president and director of the Baltimore, Md., plant; J. Darwin Ross, general manager of the Baltimore plant; and C. Kenneth Smith, treasurer. Harold W. Miller was promoted from comptroller to assistant treasurer.

Plant Manager

GLENN LINDSEY has been named manager of the Bowie, Texas, ready-mixed concrete plant of Sherman Concrete Co. He succeeds W. C. Buchanan, who has been appointed manager of the Paris Concrete Co., Paris, Texas, subsidiary of Sherman Concrete Co. Mr. Lindsey has been associated with the Bowie plant since it was opened in 1953.

Permanente Works Manager

JAMES G. HANSEN has been appointed works manager for the new Cushenbury, Calif., cement plant and quarry of Permanente Cement Co., Oakland, Calif., which is scheduled for opening this Fall, according to an announcement by Wallace A. Marsh, vice-president and general manager. Mr. Hansen, who has had 18 years of mining engineering experience in the operation and development of raw material deposits, was formerly manager of the Eagle Mountain, Calif., iron ore mine of Kaiser Steel Corp. He is a native of Eureka, Utah, and received his degree in mining engineering from the University of Utah, Salt Lake City. He is a member of the American Institute of Mining and Metallurgical Engineers.

James G. Hansen

Cement Consultant

MARK LINTZ, consulting engineer, San Francisco, Calif., recently finished several months of exploration and sampling of cement raw materials in Arizona, for the Republic Cement Co., Prescott, Ariz. The result of the exploration is the location of some 4000 acres of cement raw materials in Hells Canyon at Drake, Ariz. Plans for the construction of a plant with an annual capacity of 750,000 bbl. of grey portland cement and 250,000 bbl. of white cement are now in progress under Mr. Lintz's supervision.

Consolidated Promotions

JOHN A. AYLER has been promoted from foreman at the Irwindale plant of Consolidated Rock Products Co., Los Angeles, Calif., to superintendent at the Yorba Linda plant. George L. Thomas, fomerly night repair foreman at the Sun Valley plant, has been named superintendent of the Hewitt plant. He succeeds G. A. Lagrone who has been made superintendent of the Sierra plant, replacing J. H. Spry, who has retired.

Phosphate Plant Manager

EDWARD R. SCAMMELL has been appointed plant manager at Western Phosphates, Inc., Garfield, Utah. He succeeds E. I. Lentz, vice-president and general manager, who has also been serving as plant manager. A native of Calgary, Alberta, Canada, Mr. Scammel graduated from the University of Alberta, Edmonton, Canada, with a B.S. degree in chemical engineering. He was formerly superintendent of the Trail, B. C., commercial fertilizer plant of Consolidated Mining and Smelting Co.

Sells Interest in Products Firm

MERRILL ALLEN, formerly president and general manager of the Watertown Cement Products Co., Watertown, S. D., has become an associate member of the Ken W. Stockton Insurance Agency in Watertown. Mr. Allen, who joined the concrete products firm in 1927 as foreman and subsequently became president and general manager, sold his interest in the company last August to Peter Rutten

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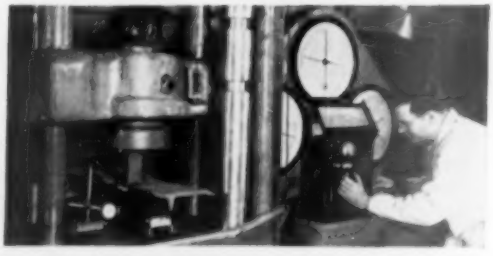

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and Ed Esser of Chicago. He is a member of the board of directors of the North Central Commercial Aggregate Ready-Mix Concrete Producers Association.

Assistant Relations Manager

GLENN COOK has been appointed assistant industrial relations manager of the Michigan Limestone Division, Detroit, Mich., of the U. S. Steel Corp., New York, N. Y.

Manager of Sales

CLIFFORD S. HANCOCK has been named manager of silicate sales, Diamond Alkali Co., Cleveland, Ohio, in addition to his duties as manager of calcium carbonate sales. He succeeds Walter R. Roberts, who has retired.

OBITUARIES

WILLIAM SHALLCROSS SPEED, chairman of the board of Louisville Cement Co., Louisville, Ky., died December 8. He was 82 years old and had been actively engaged in business affairs until about two weeks before his death. The January 1956 issue of the Speed Mixer, house organ of Louisville Cement Co., was published as a special tribute to Mr. Speed. Born in Louisville, Ky., Mr. Speed graduated from Rose Polytechnic Institute, Terre Haute, Ind., where he received the degree of B.S., M.S., M.E., and D.E. After his graduation, he joined the Louisville Cement Co. as assistant to his father, James Breckinridge Speed, president of the company. He became a director in 1901 and three years later was made vice-president and general manager. Upon the death of his father in 1912, Mr. Speed became president. In 1939 he relinquished the presidency to become chairman of the board.

When Mr. Speed began his career in the cement industry in 1895, the Louisville Cement Co. was the largest manufacturer of natural cement in the country, but with the advent of portland cements, Mr. Speed made plans for the erection of a portland cement mill at Speed in 1906. Another development under Mr. Speed's guidance, after much research and experimentation, was Brixment, a masonry cement, the first shipments of which were made in 1917. An additional mill for the manufacture of Brixment for the Eastern market was erected in the 1920's at Brixment, N.Y., near Buffalo.

On October 1, 1955, Mr. Speed completed 60 years of service with the company. This tenure of service, guidance and direction, coupled with that

William Shallcross Speed

of his father, covers a span of 90 years.

Mr. Speed was also chairman of the board of the Black Star Coal Co. and the Beaver Dam Coal Co. For 35 years he was director of the old Louisville Textile Co. and its predecessor, Louisville Cotton Mills. He also served for 24 years as trustee on the board of the University of Louisville.

WILLIAM H. WELDON, president of the Fanwood Stone Crushing and Quarry Co., the Wel-Don Concrete Corp., and the Somerset Trap Rock Corp., Westfield, N. J., died December 28 following a long illness. He was 77 years old. Mr. Weldon was also president of the Weldon Contracting Co. and had been active in the operation of this organization for over 50 years.

HARRY SMITH DAVISON, secretary-treasurer of J. K. Davison & Bro., Pittsburgh, Penn., passed away suddenly on December 13 after he became ill following a business meeting at the William Penn Hotel in Pittsburgh. He was 74 years of age. Mr. Davison was also vice-president of the Kittanning Builders Supply Co.

ALFRED T. JOHNSON, formerly sales manager of the Kansas Ctiy office of the National Gypsum Co., Buffalo, N. Y., died January 24 in Chicago, Ill., where he was attending a convention of the National Association of Home Builders. He was 42 years old. At the time of his death Mr. Johnson was general sales manager for Wadsworth Homes, Inc. Born at East Tawas, Mich., Mr. Johnson started his business career in 1936 as a clerk for United States Gypsum Co. in Alabaster, Mich. He joined National Gypsum Co. in 1941 as manager of the order department in Buffalo, was made assistant manager of the Kansas City office in 1952, and one year later became sales manager. Mr. Johnson had been general sales manager for Wadsworth Homes since 1954.

HENRY BUCHHOLZ, manager of the block plants of the Illinois Brick Co., Chicago, Ill., died February 5 while bathing at the Revolcadero beach in Acapulco, Mexico, where he had been spending a winter vacation with his wife. He was 58 years old. Mr. Buchholz had attended the National Concrete Masonry Association convention in New Orleans, La., before going to Mexico.

CLARENCE B. DOWNS, owner of the Kenmore Sand and Gravel Co., Seattle, Wash., died January 7 after a brief illness. He was 59 years old. Born in Evanston, Wyo., Mr. Downs moved to Seattle in 1912. He was superintendent of the Glacier Sand and Gravel Co. for several years before purchasing the Kenmore Sand and Gravel Co. in 1945.

DANIEL H. CRIGGER, superintendent of the Milwaukee, Wis., distributing plant of Huron Portland Cement Co., Detroit, Mich., died suddenly on January 26. He was 68 years old and had been superintendent of the plant for 30 years.

ALFRED A. LADWIG, director of the Otto Ladwig and Sons Concrete Products Co., Milwaukee, Wis., which was founded by his father, died suddenly on January 31. He was 61 years of age. A native of Merrill, Wis., Mr. Ladwig had resided in Milwaukee since 1904.

CHARLES E. TROSTEL, owner and operator of the Trostel Gravel Co., Troy, Ohio, from 1924 to 1943, passed away recently at the age of 83.

WILLIAM J. MURPHY, vice-president and director of the American Potash and Chemical Corp., New York, N. Y., died suddenly in Glen Ridge, N. J.

WAYNE A. MCGOWAN, vice-president and general manager of the Ideal Sand and Gravel Co., Mason City, Iowa, died suddenly on December 14. He was 54 years of age.

EZRA M. KAMMERER, an associate owner of the Kammerer Concrete Products Co., East Peoria, Ill., died December 26 after an illness of six weeks. He was 48 years old.

JAMES E. FREELAND, SR., manager of the American Sand and Gravel Co., Watertown, S. D., died December 6 following a short illness. He was 63 years of age.

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These revolutionary advances in design and performance of electric shovels are just two of the reasons why operators and owners are pointing to P & H for their outstanding achievement in electric shovels . . . why P & H now is at the head of the Big Three . . . why P & H can promise you the only modern electric shovel.

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For a clearly illustrated description of Magnetorque* and how it sets a new standard for electric shovel design and operation, write for Bulletin X-156. Other booklets available on electric shovel models from 3 to 10 cu. yd. capacity. A copy of these publications will be sent those who request it on their company letterhead.

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Texaco Ursa Oils, especially designed for use in diesel and heavy duty gasoline engines, embody powerful detergent and dispersive properties that keep engines clean . . . assure free rings, proper valve seating, full compression and complete combustion.

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A Texaco Lubrication Engineer will gladly help you simplify your lubrication, step up efficiency and save money throughout your operation. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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TUNE IN: TEXACO STAR THEATER starring JIMMY DURANTE on TV Sat. nights. METROPOLITAN OPERA radio broadcasts Sat. afternoons.

INDUSTRY NEWS

Cover Picture

THIS MONTH'S COVER ILLUSTRATION shows an interesting phase of the Erie Stone Co., operations near Bluffton, Ind. The picture shows the main quarry in the background, and in the foreground are portable plant crushing and screening units with a D6 Caterpillar diesel tractor equipped with a No. 6A bulldozer for stockpiling the crushed stone. Portable plant operation in connection with permanent plants is an increasing trend in the aggregates industries. This has been brought about by the necessity for selective quarrying where the sources of stone may vary considerably, and also to cut down haulage distances.

Enters Lightweight Aggregate Field

SAYRE & FISHER BRICK CO., Sayreville, N. J., has entered the lightweight concrete aggregate field, utilizing clay deposits nearby. R. F. Leftwich, consulting concrete engineer for the company, is designing the aggregate plant, and a research department has been organized for the purpose of expanding the use of the firm's product. The plant is located on the bank of the Raritan River in industrial New Jersey, facilitating transportation of the aggregate throughout the East Coast, to meet regional demands.

Develops Phosphate Deposit

STAUFFER CHEMICAL CO., New York, N. Y., has established the existence of large deposits of phosphate rock near Bear Lake, Idaho. Commercial grade phosphate rock reserves are estimated to be over 5,000,000 tons, which may be doubled or tripled if beneficiation of lower grade secondary beds proves feasible. San Francisco Sulphur Co., San Francisco, Calif., is developing the deposit in cooperation with Stauffer geologists. Development includes a 1400-ft. mine entrance at mining depth to the main phosphoric deposit, a 3000 ft. drift along the main bed, and a 1500-ft. raise from the adit and drift to the surface of the deposit. Total cost of the project is expected to be about $400,000.

The deposit will provide a reserve for Stauffer's phosphate fertilizer plants at Richmond, and Vernon, Calif., and Tacoma, Wash., as well as for the Garfield, Utah, plant of Western Phosphates, Inc., an associate company.

Gypsum Products Plant

NATIONAL GYPSUM CO., Buffalo, N. Y., is nearing completion of its gypsum products plant at Westwago, La., as announced by Melvin H. Baker, board chairman. When completed in the spring, the plant is expected to be able to produce enough gypsum building products for about 50,000 homes annually, relieving substantially the shortage of gypsum building materials in the South. The Westwago plant is part of the company's five-year, $75,000,000 expansion program. The company has three other plants under construction and is expanding four others. Three ore carriers are also being built, the L. R. Sanderson, which is nearing completion at Nordseewerker, Emden, Germany, and two others.

Doubles Cement Output

WYANDOTTE CHEMICALS CORP., Wyandotte, Mich., has announced the expansion of its cement plant facilities, at a cost of approximately $2,500,000, doubling production to almost 2,500,000 bbl. of cement annually. Air pollution control equipment will be installed, including electro-static precipitators. Clinker coolers have already been installed, and linings have been extended to the full length of the plant stacks. Two additional silos, additional cement conveying systems and expansion of bulk loading facilities are also included in the program.

The chemical corporation also manufactures chlorine, soda ash and caustic soda, as well as specialized cleaning compounds. Robert B. Semple is president.

Sand and Gravel Barges

FOUR 135-FT. SAND AND GRAVEL BARGES for J. K. Davison & Bro. are being constructed at Dravo Corp.'s Neville Island Shipyard, Pittsburgh, Penn. The barges, similar in design to two others delivered by Dravo to the same firm in 1951, will be used for company operations on the Allegheny and the upper Ohio rivers in the vicinity of Pittsburgh.

Speed Cement Plant Expansion

CALAVERAS CEMENT CO., San Francisco, Calif., has advanced by several months the completion date of its San Andreas, Calif., plant expansion program which was originally scheduled for the end of 1956. Major item in the program is a 360-ft. rotary kiln being manufactured by Bethlehem Pacific Coast Steel Corp. The kiln is the company's fifth, and will increase the cement production by 30 percent to

Calaveras Cement Co. officials watch a sheet of ¾-in. steel plate being rolled into dimensions of the cement company's fifth kiln

more than 4,500,000 bbl. of cement annually.

Cement storage silos, slurry tanks, and a tertiary crusher have already been added, and new coolers, electric precipitator, multiclone, thickener, raw and finish mills, auxiliary buildings, and materials handling equipment are yet to be installed.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 27,924,000 bbl. of finished cement in October, 1955, as reported by the Bureau of Mines. This was an increase of 8 percent over the October, 1954 figure. Mill shipments totaled 28,641,000 bbl., an increase of 6 percent above October, 1954, while stocks were 9 percent less than those on hand at the same time in 1954. Clinker production during October, 1955, totaled 26,818,000 bbl., an increase of 7 percent over the October, 1954, figure. The output of finished cement during October, 1955, came from 157 plants located in 37 states and Puerto Rico. During the same period of 1954, 25,887,000 bbl. of finished cement were produced.

Asks Probe of Rail Rates

THE BEDFORD GROUND LIMESTONE Co., Bedford, Ind., has filed a petition with the Indiana Public Service Commission seeking an investigation of rates charged by nine railroads. The company stated that rates from Bedford, for agricultural limestone in carload lots, were "unjust and unreasonable," resulting in discrimination against the company in competition with other limestone companies. The railroads named in the petition included: Baltimore & Ohio; Chicago & Eastern; Chicago, Indianapolis & Louisville; Chicago, Milwaukee, St. Paul & Pacific; Illinois Central; Louisville & Nashville; New York Central; Pennsylvania and Southern railroads.

Buys Bulk Ore Carrier

HURON PORTLAND CEMENT Co., Detroit, Mich., has purchased a 440-ft. bulk ore carrier, the E. C. Collins, from the Kinsman Transit Co., Cleveland, Ohio. The steamer was built in 1904 by the American Shipbuilding Co. The cement company has no immediate plans for reconstructing the Collins into a self-unloading cement carrier, according to Paul H. Townsend, president. The purchase brings the company's total number of ships to six.

Expansion Progresses

PERMANENTE CEMENT Co., Oakland, Calif., is continuing its expansion program, as scheduled, and expects its completion by the Fall of 1956. The program includes addition of a sixth kiln at the cement plant near San Jose, Calif., increasing capacity by 20 percent, and the building of a cement plant, costing about $12,000,000, at Cushenbury, near Apple Grove, Calif.

In addition, Kaiser Gypsum Co., Inc., a wholly-owned subsidiary, is expanding the capacity of its Long Beach, Calif., plant by 60 percent, and is building two new plants near Antioch, in the San Francisco Bay area, which are also scheduled for completion by Fall.

Consolidates Principal Offices

NEW YORK TRAP ROCK CORP., New York, N. Y., has announced plans for consolidation of its principal offices in Rockland County, N. Y. The executive, operating, sales and general accounting staffs will be housed in an office building to be erected at West Nyack, N. Y. The change is expected to result in more effective management of the company, as well as to bring it closer to the communities in which it operates.

In 1955, the company produced over six million tons of stone products. The firm operates a fleet of 210 barges to supply its markets, and accounts for more than a third of the total tonnage moving on the Hudson River.

Expands Cement Plant

PITTSBURGH PLATE GLASS Co., Columbia Cement Division, is expanding its cement plant at East Fultonham, Ohio, to increase the plant's capacity by about 40 percent. A 12-x 450-ft. kiln, a 12 x 17-ft. auxiliary grinding mill, and a building to house the equipment are being added. The company is also converting its quarry operations from open-pit to underground, tunnel mining, as open quarry reserves at East Fultonham are expected to be exhausted within two years, and the remaining 30-ft. vein of limestone underlies from 200 to 350 ft. of overburden.

Gypsum Plant Expansion

UNITED STATES GYPSUM Co., Chicago, Ill., has announced plans for the expansion of facilities at its Philadelphia, Penn., plant. The project will include a new finished goods warehouse, additional storage and packing facilities in the plaster plant, improved truck-loading accommodations, and added storage for raw materials in the board plant. The program is scheduled for completion by mid-summer of 1956, and will increase production and provide for greater inventories to meet peak demands. The plant produces gypsum lath and sheathing, gypsum wallboard, gypsum tile and a full line of plaster products, including industrial plasters.

The Philadelphia plant expansion is another phase of the company's multi-million dollar expansion program, which includes the building of new plants, and the modernization and expansion of existing facilities. A new plant was recently completed at Stony Point, N. Y., on the Hudson River, and additional mineral properties have been acquired, as well as new ships added to the company's ocean-going fleet of raw material carriers. The company has 56 plants and operating properties in the United States, Canada and Jamaica. Sales offices are maintained in 46 principal cities.

Ideal Cement Expands

IDEAL CEMENT Co., Denver, Colo., has announced plans to build a cement plant at Ada, Okla., costing about $12,000,000, instead of adding to its present plant there. The new plant, which will include two kilns, is expected to have a daily capacity of 9000 bbl. of cement, and will increase the company's production capacity at Ada from 2,400,000 bbl. to 5,200,000 bbl. of cement annually. The expansion is part of a program designed to increase overall capacity by about 5,500,000 bbl. in 1956, from the estimated 22,500,000 bbl. of cement produced by the company in 1955. About $32 million will be spent on expansion during 1956, and from $18 to $25 million in 1957, according to Cris Dobbins, president.

To Build Peruvian Cement Plant

CEMENTO ANDINO S. A., a Peruvian corporation, has announced plans to build a cement plant in the Central Sierra region of Peru, which will have a capacity of about 495,000 bbl. of cement annually. The firm is also installing hydro-electric facilities of 5920 kw. rated capacity.

Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of December, 1955, the 12 months of 1955, and the month of January, 1956, were listed by the Portland Cement Association as follows:

	Sq. yd. awarded		
	December 1955	during 12 months, 1955	January 1956
Roads	4,838,805	40,733,279	3,286,704
Streets and alleys	2,289,761	35,104,099	2,340,832
Airports	1,150,340	17,621,234	1,291,964
Total	8,278,906	93,458,612	6,919,500

College Grant

THE NATIONAL GYPSUM Co., Buffalo, N. Y., has made a $200,000 educational grant to the University of Buffalo.

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Centrifugal Discharge Bucket Elevators

First really new concept of elevator design in years!

The Rex Rated Centrifugal Discharge Bucket Elevator is a new approach to elevator design and operation — the result of exhaustive engineering research and field testing. Specifically designed for heavier loads, bigger capacity, longer operating hours — designed to meet the increased production demands of modern mill operations.

Balanced design is the secret

Rex Rated Bucket Elevators are designed around a sound engineering concept — Balanced Design. First, each part of the elevator is balanced against other parts for maximum operating efficiency, strength, durability. Next, these balanced components are combined to form an elevator that is matched against the exacting, tough requirements of cement mill operation. The elevator is fitted to the job — not only to fill the needs of today's heavier production schedules, but to meet the requirements of future, larger production schedules. Balanced design gives you balanced performance!

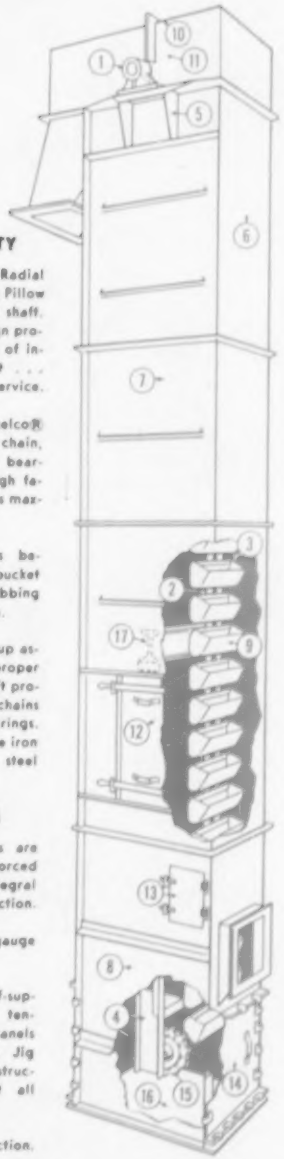
Greater capacity

One feature of Rex Rated Centrifugal Discharge Elevators is increased capacity. In fact, they more than meet the needs of closed-circuit grinding systems.

A hooded bucket and balanced chain design permit closer spacing of larger buckets. These elevators actually overlap the capacities of super-capacity elevators, while retaining the advantages of economy and dependability.

Most economical method for elevating materials

Compared to other elevating methods, Rex Rated Bucket Elevators give you three distinct cement mill application advantages: (1) takes little space — saves valuable floor area; (2) simple, vertical design cuts construction costs; (3) Rex Rated Balanced Design, practically eliminates down-time and production lags of ordinary elevators.



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1. Shafer Double Roll Radial Thrust Roller Bearing Pillow Block supports head shaft. Unique bearing design provides a high degree of internal self-alignment . . . assures dependable service.
2. Heavy-duty Chabelcor® steel non-roller type chain, selected on low live bearing pressures and high fatigue strength, assures maximum life.
3. Generous clearances between casing and bucket edges eliminate rubbing . . . assure longer life.
4. Internal gravity take-up assures constant, proper alignment of foot shaft providing longer life for chains and sprockets and bearings. Has heat-treated white iron and hardened tool steel sleeve bearings.

RUGGEDNESS

5. Head shaft bearings are supported by reinforced bracket supports, integral with the lower head section.
6. Head section of ten-gauge steel.
7. "Sky-scraper" self-supporting casing, with ten-gauge steel side panels crimped for stiffness. Jig welded dust-tight construction. Dust seals at all flanges.
8. ¼-inch steel boot section.

BIG CAPACITY

9. Deep, wide buckets with hooded back and high front, closely spaced, assure maximum capacity, and complete discharge.

CONVENIENCE

10. Twelve-gauge steel split head section assures easy access to head shaft machinery.
11. Hardened cast steel segmental rim traction wheel with cast iron body keyed to head shaft.
12. Large access doors for easy maintenance and inspection.
13. Hinged type inspection door.
14. Front and rear access panels secured with special quick-acting spring clips.
15. Hardened cast steel segmental rim foot sprocket with solid cast iron body keyed to foot shaft. Rim sections easily replaced when worn.
16. Steel bottom plate assures easy cleanout.
17. Take-up removal beam.

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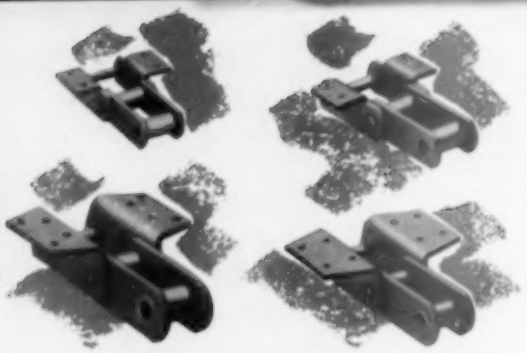
And for any elevator... these Rex balanced components add greater capacity, extra life



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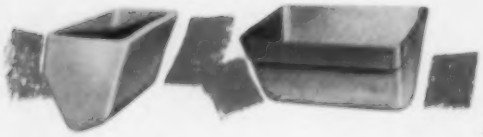
New and improved chains were developed to meet the larger capacities of the Rex Rated Elevators. The result — chains designed for greater strength and durability that answer the requirements of every condition.

BALANCED DESIGN . . . Chain parts are balanced for utmost strength, lightest weight. There is less dead weight, less unneeded bulk. These chains take less horsepower to move than other chains for this service.

MAXIMUM WEAR-LIFE . . . High quality steels, proper heat treatment, controlled press fits, large bearing areas, hardened surfaces plus fine workmanship assure maximum wear-life.

ACCURATE PITCH . . . Close tolerances and controlled fits maintain accurate pitch for long, top-performance. Wide links and generous attachment length provide extra support for modern, large-capacity buckets.



Large-capacity buckets

The development of new chains permitted the use of buckets of new design. These buckets take bigger loads and discharge fast. Even fluffy and aerated materials load and dump quickly. Chains and buckets are matched for greatest strength, capacity and durability.

Style AC buckets

Special hooded back maintains a high discharge efficiency even when buckets are continuously spaced. And the high front increases the "water level" capacity to allow greater capacity for free-flowing dry materials. Special air vents in the bottom act as a relief valve to prevent trapping during loading and unloading of fluffy, aerated materials. Extra thick bucket walls provide greater strength, longer wear.

Style AA buckets

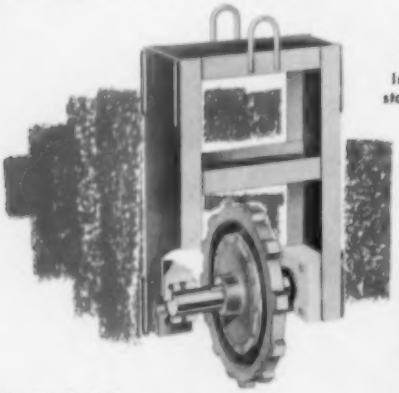
Exceptionally tough and wear-resistant for handling heavy, abrasive materials. Cast of high-grade Rex Quality Malleable Iron. Front lip is extra thick for longest life.

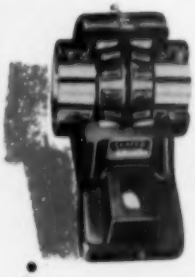
Segmental rim sprockets and traction wheels

These tough and long-lasting sprockets and traction wheels have a special hardened, demountable cast steel rim. When replacement becomes necessary, you need only replace the rim section. Sprocket rims are machined both sides — are easily reversed to give double life. Besides giving extra long service, these sprockets and traction wheels will reduce down-time — save you hours, even days, of time.

Internal gravity take-up

This internal gravity take-up assures proper alignment of the foot shaft by automatically compensating for chain and sprocket wear and temperature variations. Chains, bearings and sprockets work better and last longer. Internal mounting makes boot section dust-tight. Special long-life bearings stand the roughest service without attention.





Shafer Self-Aligning Roller Bearings

Unique internal self-aligning feature of this bearing works smoothly when other bearings fail.

Mounted on the elevator head shaft, these Shafer® Double-Row Radial Thrust Bearing Pillow Blocks have a high degree of internal self-alignment. Heavy-duty construction plus self-aligning feature and special "Z" lubricant seal insures longest service. Micro-Lock adjustment makes installation and adjustment easy.

CHAIN Belt Company
Dept. RP-1
Milwaukee 1, Wisconsin

- ☐ Send catalog on REX RATED Centrifugal Discharge Bucket Elevators.
- ☐ Send catalog on new Rex Bucket Elevator Components.
- ☐ I would like a CHAIN Belt Sales Engineer to call.

Name .....

Address .....

Company .....

City..... Zone..... State.....

CHAIN BELT COMPANY
MILWAUKEE 1, WISCONSIN

To Open Limestone Quarry

BLUE RIDGE STONE CORP., Roanoke, Va., is developing a limestone quarry between Lynchburg and Rustburg, Va., with an expected production of 1500 tons daily. The quarry will be known as the Lynchburg Division of Blue Ridge Stone Corp. A plant will be located on an 87-acre site purchased from Jubal Ferguson, and 109 ft. deep holes have been drilled over about 25 acres of the land which indicate the deposit will supply 1500 tons of limestone daily for 25 years. The Norfolk & Western Railway will handle some of the limestone shipments, although much of it will be shipped by truck. Abney Boxley is president of the corporation, and B. M. Erskin is manager and general superintendent.

Cement Plant Opens

CALIFORNIA PORTLAND CEMENT Co., Los Angeles, Calif., has begun operations at its cement plant at Mojave, Calif. The plant, costing about $12,000,000, has a daily production of from 6000 to 7000 bbl. of cement at the start. Multiclones and electric precipitators are utilized to eliminate dust at the plant. George Moyli is plant superintendent; O. L. McCain, plant chemist; R. G. Paterson, production manager in charge of construction; and L. E. Dixon is general contractor. The plant was designed to accommodate additional facilities if capacity increases are desired in the future.

Plans Asbestos Plant

EASTERN ASBESTOS CO. has announced the building of a 200-ton daily capacity asbestos plant, costing about $300,000, in the province of Quebec, Canada. Pilot plant testing of bulk samples is proceeding as a preliminary to completion of flow sheet research and plant design. C. S. Boland Development Co. of Noranda has been doing the drifting work in the various ore zones, with crosscuts at 200-ft. intervals.

Santa Cruz Cement Plant Sold to Pacific Coast Aggregates

STOCKHOLDERS OF SANTA CRUZ PORTLAND CEMENT CO., San Francisco, Calif., voted at a special meeting to liquidate the company and sell its cement business and related assets to Pacific Coast Aggregates, Inc., for $12,000,000 cash. In liquidation, the holders of Santa Cruz Portland's 100,000 $50 par value shares will receive an estimated $165 per share for their stock holdings.

Pacific Coast Aggregates is expected to register a new stock issue with the Securities & Exchange Commission. The proceeds will be used for part of the purchase price of Santa Cruz Portland.

Santa Cruz management submitted a balance sheet showing total assets of $11,209,846 as of November 30, 1955, including cash of $1,094,429 and net receivables of $704,232. Total current assets were $2,709,385 and current liabilities $1,729,763. Earned surplus was $4,322,052. In 11 months ended November 30, 1955, Santa Cruz had sales of $6,361,899 and net income of $1,523,591 after taxes and charges. This exceeded sales and earnings for the full year 1954, when sales were $5,129,113 and profit $1,225,433.

Pacific Coast Aggregates' purchase price of $12 million for Santa Cruz's assets will include the 70,000 shares of Aggregates' common stock which is owned by Santa Cruz. Consummation of the sale by Santa Cruz is expected during March, 1956. The operating assets which Pacific Coast Aggregates will purchase amount to $8,503,022 and that company will assume operating liabilities of $283,398. Santa Cruz expects to declare an initial liquidating dividend of $5 a share soon after March 1, and to complete the liquidating within a year. It will pay a commission of $275,000 to Schwabacher & Co.

Cancels Expansion Plans

IDEAL CEMENT CO., Denver, Colo., has cancelled plans for a $6,000,000 expansion program for its cement plant at Okay, Ark., pending settlement of the Millwood Dam controversy. If constructed as a reservoir, Millwood Dam would cut off the company's railroad line. The dam is the subject of a controversy among Little River Valley, Ark., residents: the Little River Valley Improvement Association favors a modified Millwood, with construction of six upstream dams. However, groups from Hope, Ashdown and Texarkana, Ark., want the dam to serve as a reservoir.

To Reopen Quarry

LOUISVILLE SAND & GRAVEL CO., Louisville, Ky., plans to reopen limestone strata along the Ohio River northeast of Utica, Ohio, producing crushed limestone for use as a concrete aggregate. About 82 acres of land optioned by the company has been rezoned from agricultural to industrial use. The company plans to construct an overhead conveyor across Utica Pike for barge-loading operations.

•

A.B.C. SAND & GRAVEL CO., INC., has been formed in Milwaukee, Wis., with an authorized capital stock of 100 shares of common, no par value.

Coming Conventions

March 6-10, 1956—
American Concrete Pipe Association, 48th Annual Meeting, The Broadmoor, Colorado Springs, Colo.

March 16, 1956—
Indiana Mineral Aggregates Association, Annual Meeting, Claypool Hotel, Indianapolis, Ind.

April 12-14, 1956—
American Concrete Agricultural Pipe Association, Sixth Annual Convention, Brown Palace Hotel, Denver, Colo.

April 13-14, 1956—
Texas Aggregates Association and Texas Ready Mixed Concrete Association, Joint Annual Convention, Statler Hilton Hotel, Dallas, Texas.

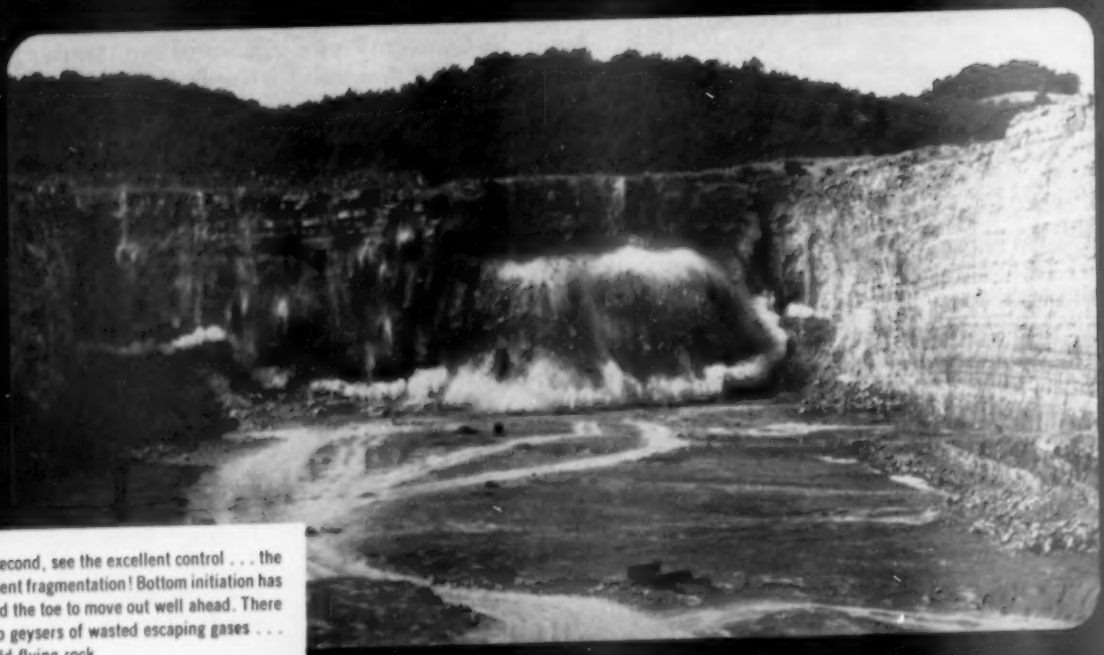
April 23-25, 1956—
Autoclave Building Products Association, 50th Annual Convention, Hotel Statler, Detroit, Mich.

May 16-18, 1956—
National Industrial Sand Association, Spring Meeting, The Homestead, Hot Springs, Va.

June 17-22, 1956—
American Society for Testing Materials, 59th Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

For maximum shovel production, less wear and tear on equipment . . .

Another outstanding ROCKMASTER quarry blast! A 128 ft. limestone face . . . 18 ft. burden. 134 ft. hole depth, stemmed 16 ft. Bottom initiation prolongs confinement of explosives force . . . puts energy to work shattering rock instead of air. At ½ second, note how blast is "pushing" burden out from face.



At 1 second, see the excellent control . . . the excellent fragmentation! Bottom initiation has caused the toe to move out well ahead. There are no geysers of wasted escaping gases . . . no wild flying rock.

PROLONGED CONFINEMENT COUNTS

Here's how the blast was fired

Progressive series pattern
3 holes
Caps: ROCKMASTER delays 0, 2, and 3
Explosives: Atlas Apex No. 4 HV
and Atlas 75% Giant Gelatin

Prolonged confinement really pays off! Noise and vibration have been held to a minimum. There's good, balanced breakage . . . no secondary shooting required. Here's a well-displaced 22,000 ton muck pile ready to be worked. Notice that good shooting has kept the quarry face straight and clean!

PROLONGED CONFINEMENT—the Rockmaster® way

The proof of the shooting is in the muck pile! Good shooting here at Watauga Stone Co., Watauga, Tenn., gives good uniform breakage and good displacement. This means better loads of well fractured material in the shovel and trucks . . . less wear and tear on equipment . . . economies all along the line.

Secret of this good shooting is *prolonged confinement.* The blast, initiated at the bottom of the holes with ROCKMASTER millisecond delay electric blasting caps, pulls the toe first and expends itself working on the burden. It's this right combination of ROCKMASTER blasting caps and Atlas explosives that shows—

- **good control**
- **improved breakage**
- **greater efficiency**
- **better public relations**

To get the most out of your blasting methods and your explosives, discuss prolonged confinement with your Atlas representative. You can benefit by his ideas and experience. And get "Better Blasting"—Atlas' informative newsletter on latest methods and materials. Write us to put your name on our mailing list today.

EXPLOSIVES DEPARTMENT
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
offices in principal cities

CHAMPS OF EVERY

NEW 1956 CHEVROLET

WEIGHT CLASS! CHEVROLET

New Chevrolet trucks for '56 bring you new heavies, middleweights and lightweights in eight great new series—new power and performance to save more money on your hauling job!

New Heavyweights—New Tandems! All-new heavyweights in 9 wheelbases, with maximum G.V.W. ratings up to a new high of 32,000 lbs.; G.C.W. up to 50,000 lbs.

Ultra-Modern Features! Tubeless tires, standard; High-Level ventilation and panoramic visibility; plus Concealed Safety Steps on most models.

Wider Range of Drives! There's an automatic drive in every series with new Powermatic for most middleweights and heavies; Hydra-Matic for light-duty models. Both extra-cost options. A new 5-speed transmission is standard in 9000 and 10000 series models; optional at extra cost in other heavies and most medium-duty models. New heavy-duty 5-speed is an extra-cost option in models with new Loadmaster V8.

A Modern V8 for Every Model! And introducing the completely new 322-cu.-in. Loadmaster V8, standard in new 9000 and 10000 series heavyweight models.

See Your Chevrolet Dealer and his new Task-Force line before you buy. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

TASK·FORCE TRUCKS

HINTS AND HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Prevent Tramp Iron from Damaging Crusher Rolls

A WEST COAST PRODUCER of granite grit for poultry feed products installed a 14-in. Eriez permanent plate magnet

Removing large pieces of tramp iron from the face of 14-in. permanent, non-electric plate magnet installed above belt conveyor feeding granite to 36-in. crushing rolls

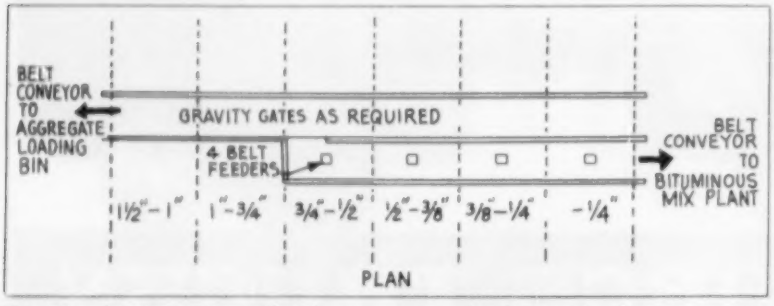
above a belt conveyor feeding 36-in. crushing rolls to prevent tramp iron damage to the rolls. Trouble-free operation of crusher has helped to double production.

The extreme hardness of the granite being processed necessitates hard-facing the crushing rolls with a very tough but unavoidable brittle type of welding rod. Although small pieces of metal might not show much effect on the rolls, larger pieces, such as bolts, nut and rock drills on reaching the rolls would crack the hardfacing, resulting in a shutdown while repairs were made.

Dual Reclaiming Tunnel

A WESTERN CRUSHED STONE PRODUCER stores six sizes over two reclaiming tunnels as shown in the sketch. The longer tunnel has a reclaiming belt conveyor that delivers to the truck loading bins. Conventional gravity gates are used. The shorter tunnel has a belt conveyor that runs in an opposite direction from the first and this belt conveyor delivers material to a bituminous mix plant.

Under each of the four sizes of material to be sent to the bituminous mix plant is a belt feeder arranged to control the amount of material coming from each storage pile. Tunnels are of concrete and are interconnected as shown in the sketch.



Plan of reclaiming system with belt conveyors running in opposite directions, one to bituminous mix plant and the other to truck bins

Remote-Controlled Shuttle Belt

AT A SAND AND GRAVEL PLANT in one of the western states, an excess of sand is produced and a larger stockpile than usual is necessary to store it.

Located at the end of the stacker

Close-up of hand winch that moves shuttle belt conveyor at end of long belt conveyor

belt conveyor is a shuttle belt that moves parallel to the long axis of the main belt conveyor which also can be moved. The shuttle belt conveyor is

Shuttle belt conveyor at end of 180-ft. conveyor for sand is controlled by hand winches formerly used as shore line controls on dredge

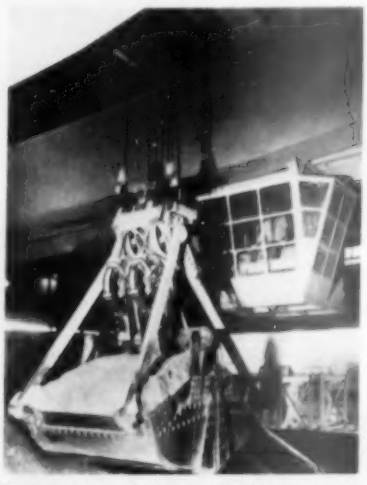
operated from a control station almost 200 ft. away by means of a hand-operated winch.

The head pulley of the main sand belt conveyor is corrugated to help prevent "carry-back" of the damp sand on the under side of the belt. Where drainage of sand is important, a shuttle belt conveyor of this type might be used to advantage.

Prevent Crane Bucket Dribbling

AT AN EASTERN CEMENT PLANT, a specially designed 5-cu. yd. bucket on an overhead traveling crane was installed to minimize "dribbling" of fine granular materials with consequent dusting. The four line bucket

(Continued on page 43)



Bucket suspended from overhead traveling crane designed to minimize dribbling

SAND or STONE...

it's all the same to the PAYLOADER®

The quick acceptance and success of the 4-wheel drive tractor-shovel probably has no parallel in material-handling equipment history. Pioneered and first introduced by Hough in 1948, this type of machine is numbered in the thousands among pits, quarries, mines, contractors, public bodies and industrial plants. Hough leadership and pioneering in the 4-wheel drive field continues and is presently represented by three new "PAYLOADER" sizes — all incorporating the "know-how" and new features that result in better performance — more production, easier and faster—at lower net cost. All three have powerful pry-out action and 40 degree bucket tip-back at ground level to dig faster, get bigger loads and carry bigger loads — safely. All three have more powerful engines — a choice of gasoline or diesel — and many other more-yardage features.

Your "PAYLOADER" Distributor will be glad to show what these new units can do — for you.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY INTERNATIONAL HARVESTER COMPANY

3 NEW 4-WHEEL-DRIVE MODELS

MODEL HO
2 cu. yd.

MODEL HH
1½ cu. yd.

MODEL HU
1 cu. yd.

THE FRANK G. HOUGH CO.
705 Sunnyside Ave., Libertyville, Ill.

Send full data on new 4-wheel drive "PAYLOADER" tractor-shovels.

☐ Model HO ☐ Model HH ☐ Model HU

Name .....
Title .....
Company .....
Street .....
City .....
State .....

Withstands far greater

SHOCK LOADS

than any standard V-belt

Here are the interesting reasons why Gates Super Vulco Ropes stand up months, even years longer than *any* standard V-belts...

1. *Super-Strength Cords* provide 40% greater horsepower capacity . . . easily absorb heavy shock loads. **2.** *Flex-Weave Cover* (U.S. Pat. No. 2519590) provides greater flexibility with far less stress on the fabric. Cover wears longer — increases belt life, lowers belt costs.

3. *Concave Sidewalls* (U.S. Pat. No. 1813698) provides sure pulling power, longer wear because sides straighten out as belt bends— make even contact with sheave walls.

Straight-sided belts bulge out when bent around sheave

Uneven contact causes uneven wear.

SHOCK LOAD of this big jaw crusher at Canadian Quarries, Ltd. is absorbed by Gates Super Vulco Rope Drive. Wherever shock load is severe, Gates Super Vulco Ropes cushion the shock—keep machinery replacement cost down.

3 other outstanding advantages

Resists Oil, Heat and Weather: Long life is assured even in the presence of excessive oil . . . even under prolonged exposure to heat and weather.

Provides Static Safety: The high electrical conductivity of Gates Super Vulco Rope provides safer drives in explosive atmosphere.

Saves Space: Higher horsepower rating and greater resiliency may permit fewer belts, or smaller sheaves where space saving is vitally important.

The Gates Rubber Co., Denver, Colorado
World's Largest Maker of V-Belts

Gates SUPER Vulco Rope

The V-Belt with 40% more horsepower capacity

TPA 57

has a net weight of 14,250 lb.

Due to this dusting condition, special alloy steel pins and manganese steel bushings have been used in the bucket, rather than ordinary bearings in most moving parts. The only exception is in the lever arm sheaves which are mounted on sealed anti-friction bearings.

The Blaw-Knox bucket also is equipped with a main hinge design which is said to insure rigid scoop alignment. Contact edges of the lips are hardsurfaced to insure maximum tight fitting over a long period of usage.

Lights for Night Quarry Work

WHEN IT IS NECESSARY TO CONTINUE WORK in a quarry at night, a portable lighting system is essential. This is particularly important when quarry operations are on several levels or

Electric lighting system mounted on old automobile chassis for portability

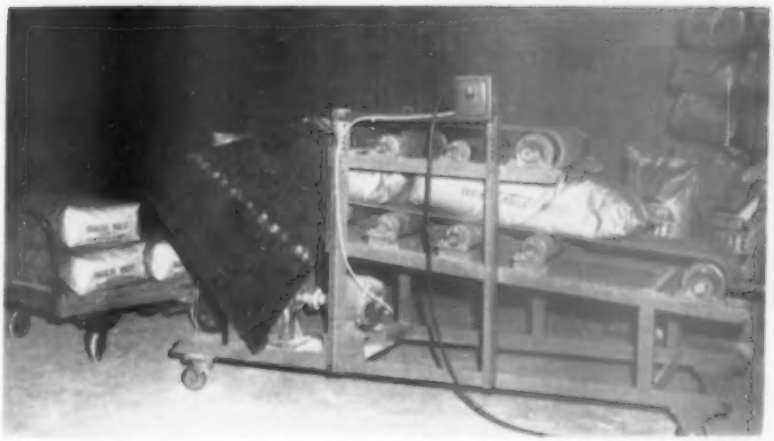
benches, and where loading is done from scattered points.

In the illustration is shown how one western quarry solved the problem by mounting a Kohler light plant on an old automobile chassis.

Bag Flattener

AS EXPANDED PERLITE packed in 4-cu. ft. bags proved to be difficult to stack, the Tennessee Products and Chemical Corp., Nashville plant employes designed and built a bag flattener which is doing a very effective job. After filling, the bags are compressed in the flattener which consists essentially of two short belt conveyors, the lower section shorter than the upper section to facilitate feeding bags to the flattener.

The expanded perlite weighs approximately 8 lb. per cu. ft., and conforms to A.S.T.M. Specification C35-53T for plaster aggregate and A.S.T.M. C332-54T for concrete aggregate.



Bag flattener to press perlite bags into shape for easier handling, stacking and loading; flattened bags, to the left, and unflattened, to the right

Three-ply paper bags are used. Tests indicate that break-down of the perlite compressed in the bags is practically non-existent.

Weld Rim On Worn Sprocket

WORN CRAWLER TRACTOR DRIVE SPROCKETS can be rebuilt by welding on a new rolled steel rim with flame-cut teeth. A procedure worked out by the Automatic Welding Co., Elm Grove, Wis., has solved the problem.

The worn teeth are removed by flame cutting continuously around the sprocket at the base of the teeth. Then a new rim of SAE 1345 steel (0.45 percent carbon, 1.60-1.90 percent manganese) is fabricated by rolling and welding a bar to a diameter which just fits the old hub section. Teeth are formed in the rim on a continuous flame-cutting machine.

Tack-welded at four points, the new

Rolled steel ring, right, above, with flame-cut teeth, is tack-welded to old cast iron hub, left, from which worn tooth rim has been removed. Below is finished sprocket

rim is then mounted on a turntable for submerged arc welding. The table rotates the assembly under a stationary Lincoln Electric LAF-2 automatic welding head. The joint is fillet-welded on both sides by the automatic hidden arc process, using a mild steel filler wire.

Protecting Lift Trucks

FRONT-END LIFT TRUCKS offer a safety problem, particularly to the driver unless the rear end of the unit

Base of column encased in cylinders painted a bright color to protect lift-truck operators

has some guard or shield to protect the operator when backing in and out of warehouse areas. Steel columns are dangerous unless some safety precautions are observed.

In one large warehouse handling palletized products, all the steel columns were protected with a steel cylindrical sleeve at the footing. In a second warehouse, steel drums were used. The protective cylinders in both cases were painted a bright orange, a color which seems to provide more visibility.

NOW *bid beating... dirt heaping...* 1956

10% bigger payloads!

Model "75" ... boosted to 20 yds heaped (without sideboards) ... 262 hp.

Model "55" ... boosted to 14 yds heaped (without sideboards) ... 172 hp.

Wide-base tubeless tires and windshield, shown, available as optional equipment.

1 **Wider "Target" Push-Block** makes it easier to make and maintain contact. Helps to cut loading and cycle time.

2 **Straight-Line Ejector Reeving** requires minimum power; leaves more power on Payscraper wheels for faster dumping and spreading. Also speeds re-threading time.

3 **Sturdy Cover Plates** protect new, stronger cylindrical ram and air tanks.

4 **New, Straight-Back Bowl** lets you heap and haul more dirt every trip. Struck capacity, *with sideboards*. 18 cubic yds on "75"—12 cubic yds on "55".

5 **Higher Apron Lift,** bigger apron opening, provides cleaner, more rapid dumping, especially of "sticky" materials.

6 **Fast-Acting Apron,** arms mounted outside bowl, assure quick, positive closing of apron. Payscraper holds the load from cut to fill.

7 **Lowered Draft Frame** provides operator with "control tower" visibility of bowl and push-tractor ... also helps direct push and pull power more efficiently to cutting edge for faster loading.

8 **Larger, Wider Fenders** give greater safety for operator, greater protection for machine.

International Payscrapers®

Put the 1956 International Payscraper to work on your job, and watch dirt boil up into its new, straight-back bowl. You've never seen any big scraper load as easily or as fast. In seconds, you've packed in up to 23 heaped yards. Its offset 3-section blade breaks the ground like a sharp-pointed spade. Dirt boils from the smooth-slicing cutting edge and fills the corners to build a full heaped load. Close the apron instantly, positively, on this huge, well-compacted load and you carry all the dirt you've heaped in.

Now, drive easily, effortlessly with safe hydraulic power steering at a fast clip to the fill. Note how the 1956 Payscraper's extremely high ratio of horsepower to capacity and its rapid acceleration to 24 mph top speed add up to more trips per hour than any other self-powered scraper you've ever used. Yes sir, it's a real profitable dirtmover, this 1956 Payscraper! Try one yourself on your job! See your International Industrial Power Distributor for a demonstration.

Maximum 52° Oscillation
from right to left takes the stress and strain out of hauls over furrows, rough ground.

Adjustable 3-Piece Cutting Edge
for clean, fast cutting and loading under all soil conditions.

New, Long-Lasting Clutch
of ceramic material and powdered metals, successfully resists heat and wear over longer periods. Available on Model 75 only.

INTERNATIONAL HARVESTER

International Industrial Power

INTERNATIONAL HARVESTER COMPANY, 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-Tired Loaders . . . Diesel and Carbureted Engines . . . Farm Machinery . . . Motor Trucks.

UNCERTAIN OPERATING COSTS BOTHER YOU?

depend on
the only

long range economy fuel

You'll win in the long run by burning Bituminous! Today and tomorrow, supply is unlimited and the vast reserves are right on the threshold of the major manufacturing centers. Bituminous, too, has the highest potential for cost improvement among competing industrial fuels. Year in and year out new methods and machines are designed to control costs and improve burning efficiency.

Let B&O's Technical Service fit this fuel to your long range power plans.
Ask our man!

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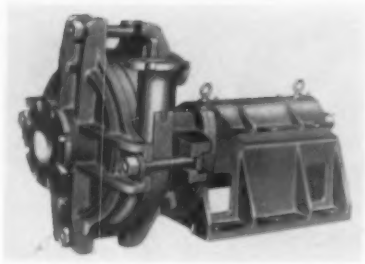
BITUMINOUS COALS FOR EVERY PURPOSE

NEW MACHINERY



Heavy Duty Suction Pump

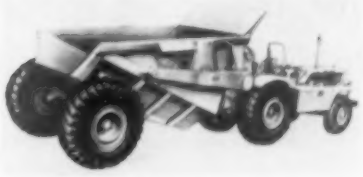
MORRIS MACHINE WORKS, Baldwinsville, N. Y., has introduced the Type Q heavy-duty suction pump to its line of slurry pumps. It is a low speed, continuous duty pump and is designed to handle abrasive slurries of cement, sand, coal, solids, chemical sludges, and other products up to the maximum fluid consistency under suction lift or positive head. The all metal pump is available in seven models from 2- to 6-in. size. The pump can be opened for most maintenance requirements, by removing four bolts, without disturbing the piping. Interchangeable liners on both sides of the impeller are featured, and the rotating element is adjustable to take up for any wear. External vanes on both sides of the impeller prevent packing between the impeller and casing. The impeller is pressure balanced to prevent recirculation, and is threaded to the shaft and sealed against corrosive action.

Tractor Shovels

PETTIBONE MULLIKEN CORP., 4700 W. Division St., Chicago 51, Ill., has brought out Speedall tractor shovels for use in those fields formerly dominated by heavy crawler equipment. The extra heavy duty power train and rugged construction are built to withstand the punishment of heavy material handling operations. Speedmatic power shift transmission, Speedall torque converter, 17 to 1 planetary drive axles and Speedall power steering are incorporated in the unit. The tractor shovels are available in three sizes with 1¼-, 1¾-, and 2½-cu. yd. struck capacities, and are offered with a gasoline or diesel engine. Various attachments may be had, including a snow bucket, lift fork, crane hook, snow plow and bulldozer blade.

Tire Changing Tool

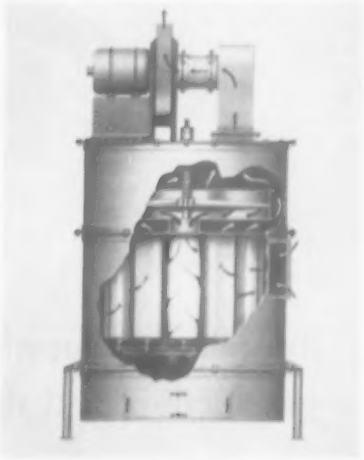
GOODYEAR TIRE & RUBBER CO., Akron, Ohio, has announced a hydraulic tire changing tool, known as the TO-100, which is applicable to all makes and designs of earth-moving rims for either tubeless or conventional tires. It consists of three parts — frame, ram and hydraulic pump. The steel jaws of the frame are fastened to the rim of the vehicle; then the ram is placed in the frame; with the pointed tip or spade of the ram inserted between the tire and rim flange. Pressure is then applied by means of the pump, forcing the spade down, prying the tire bead away from the flange and loosening it from the brad seat. A set of six metal spacers is included with the tool assembly. The spacers are used in pairs to hold the tire away from the flange, while the operator loosens the tire at other points until it is entirely off the rim.



Rear Dump Trailer

ATHEY PRODUCTS CORP., Chicago, Ill., has introduced the Athey PR 15-Cat DW 15 rear-dump trailer, with a capacity of 15.6 cu. yd., speeds up to 31.3 m.p.h., right or left angle turns of 90 deg., and simply designed, three-stage hydraulic hoists which tilt the body for quick, positive ejection of materials. The body is all-welded in one unit with high-tensile steel side plates. The bottom is of ½-in. steel over 1¾-in. solid oak plank filler over $\frac{3}{16}$-in. lower plate.

High speed, large capacity pump, flow control valve and double-acting jacks provide positive hydraulic control. Four-wheel, air-activated brakes for the tractor wheels and trailer wheels can be set individually depending upon the footing at fill. The discharge lip extends beyond the rear wheels to cast loads over the edge of the fill.



Continuous Dust Filter

THE DAY CO., 810 Third Ave. N.E., Minneapolis 13, Minn., has announced the Type RJ dust filter for handling air volumes up to 1200 c.f.m. Cleaning and discharge of material is handled automatically and continuously, eliminating the need for shut-downs. It utilizes the Hersey principle of high velocity reverse air cleaning, but differs from the principle in that the dust is deposited on the outside of the filter sleeves. Twelve filter sleeves are used in the unit, and the filter media is a felted material. The reverse air for cleaning the filter sleeve surges from an indexing drum through each sleeve individually.

All moving parts in the filter are located on the clean air side of the filter media for longer, maintenance-free life. The entire unit can be arranged for portable operation by mounting on casters. It can be furnished for pressure or vacuum opera-

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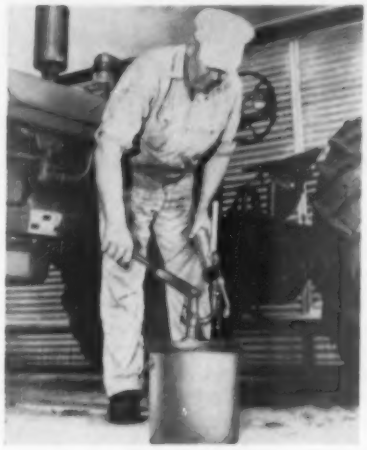
Raymond **BAG CORPORATION,** Middletown, Ohio

tion and it is also available with or without a dust fan or casters. A choice of a dust drawer or hopper for intermittent operation or a hopper and rotary valve for continuous discharge is offered.



Grease Gun Filler Pump

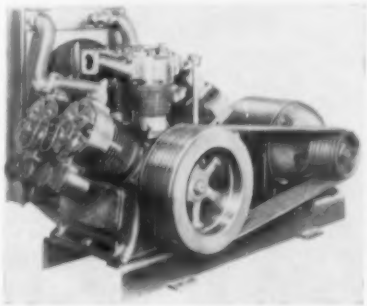
LINCOLN ENGINEERING CO., 5702-46 Natural Bridge Ave., St. Louis 20, Mo., has announced a filler pump designed to handle medium as well as light grease for attaching to any 25- to 50-lb. original refinery container by means of three thumb screws. The pump is said to fill a 1-lb. capacity grease gun in 30 sec. while completely eliminating contamination, and air-pockets. A follower plate is incorporated for positive prime in any weather, and completely empties the lubricant container. A self-closing filler socket prevents pumping of lubricant unless the filler nipple of the gun is inserted in the filler socket. Machined piston with solid cork piston ring insures maximum lubricant output on every stroke.

Self-Propelled Loader

LETOURNEAU - WESTINGHOUSE CO., Peoria, Ill., has announced an improved TraveLoader, a product of the Adams Division, Indianapolis, Ind. The unit is a self-propelled, belt-type loader for loading loose materials into trucks from windrows or stockpiles.

A rocker-type foot pedal operating an over-center clutch has been improved to also control starting and stopping — rock the pedal forward to put the loader into motion, and press it backwards to stop. Tire sizes have been increased to 13.00-24 lug type, both front and rear, for greater flotation and better ground grip. The pick-up moldboard can be tilted at either side, by means of hydraulic control from the cab, to conform the machine to the surface being worked. Other improvements include a shorter paddle-type feeder; the elimination of feeder cross shafts to permit the unit to load occasional large rock, slabs of concrete, or asphalt without damage to the feeder; an approximately 3-ft. shorter wheelbase for increased maneuverability; and an improved gear drive added between the engine and transmission.

The loader, with a choice of two conveyor lengths, is powered by an International gasoline engine or General Motors diesel engine which furnishes power for operating the feeder and conveyor, as well as propelling the machine. Several operating speeds are available, as low as .29 m.p.h. with a maximum traveling speed of 26.7 m.p.h. Loading capacity is said to be up to 10 cu. yd. per min. in loose material and up to 20 cu. yd. in snow, depending upon the type. Optional equipment is also available.



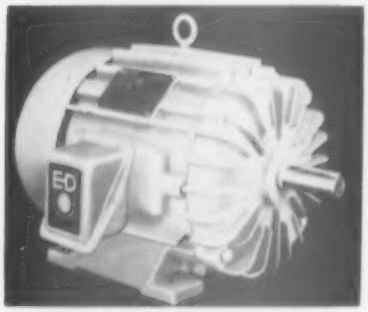
Two-Stage Compressors

WESTINGHOUSE AIR BRAKE CO., Le Roi Division, Milwaukee, Wis., has brought out a line of two-stage, air-cooled, electric motor driven compressors of 50-, 75- and 100-hp., and displacements of 260-, 415- and 550-c.f.m. at 125 p.s.i. operating pressure. Designed for applications where compactness, lightweight and a minimum of operator attention are required, the three-cylinder 50S2 and six cylinder 75S2 and 100S2 compressors have a balanced design to reduce vibration and noise. Forced feed lubrication, by a positive plunger type oil pump, is included. Standard equipment of the belt-driven units includes a Dual-Control to provide a choice of start-and-stop duty of both motor and compressor or a continuous running of motor with intermittent compressing. The latter selection permits the compressor cylinders to unload instead of compressing when the desired pressure is reached.

Crawler Tractor

THE OLIVER CORP., 400 W. Madison, Chicago 6, Ill., has brought out an improved Model OC-18 crawler tractor, powered by a 161-hp. diesel engine. Power-Turn Steering is featured, combining the advantage of controlled differential steering with those of clutch steering. It permits making spot turns or gradual turns of various angles, and also allows decreasing speeds by 38 percent, without shifting, with an increase in drawbar pull or push of up to 60 percent, depending on weight and traction.

Improvements also have been made on the heavy-duty track frame and tracks as well as the incorporation of a more rugged and efficient transmission. A Hi-Life wheel system featuring anti-friction bearings is also available in this model.



Totally-Enclosed Motor

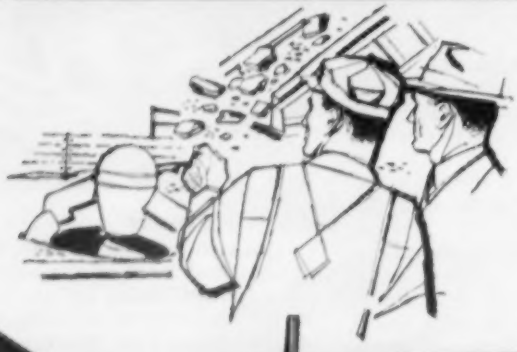
GENERAL DYNAMICS CORP., Electro Dynamic Div., Bayonne, N. J., has introduced a rerated, totally-enclosed, non-ventilated and a totally-enclosed, fan-cooled motor conforming to N.E.M.A. dimensional standards. The complete housing and end-brackets are constructed of solid cast iron ribbed frame. The motor, designated type "H", is designed for operation where

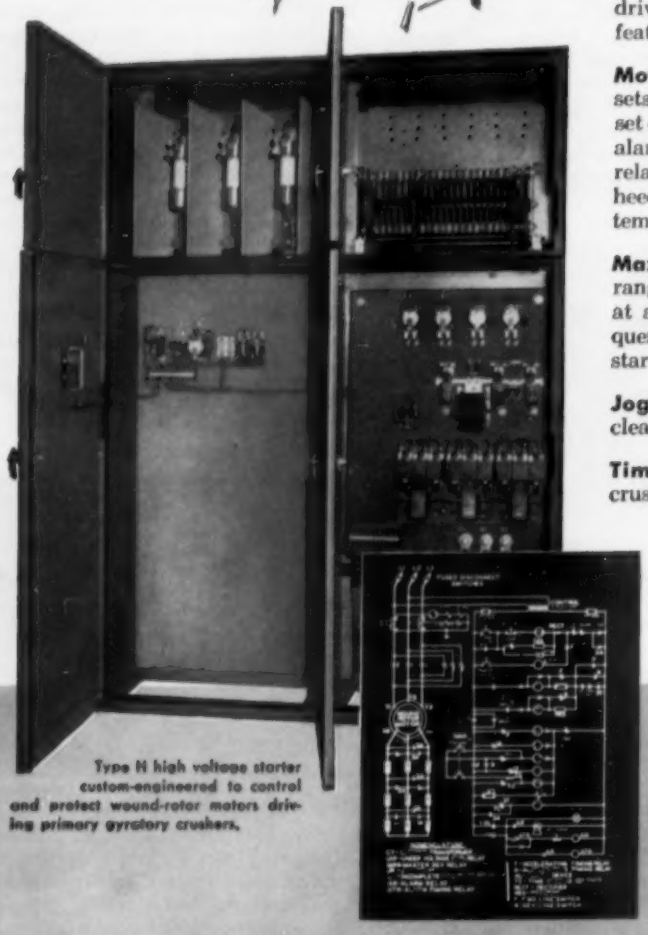
CUT CRUSHER DOWN-TIME

with Custom-Engineered

ALLIS-CHALMERS

CONTROL





Type H high voltage starter custom-engineered to control and protect wound-rotor motors driving primary gyratory crushers.

Allis-Chalmers has built and installed hundreds of gyratory crushers in the past 75 years. Drawing on this experience, A-C engineers have developed a control circuit designed to cut costly down-time in the rough-tough job of rock and ore crushing. This control circuit is considered by rock products operators to be the ultimate in control and protection for wound-rotor motors driving primary gyratory crushers. Here are some features of this circuit:

Motor Overload Protection — Two separate sets of thermal overload relays are provided. One set operates on slightest overload to sound remote alarm horn and energize indicating light. These relays do not stop motor. If warnings are not heeded, a second set of relays stops motor when temperature reaches danger point.

Maximum Torque Starting — Control is arranged so that maximum torque can be obtained at any time while motor is being started. Frequently, application of maximum torque permits starting a stalled crusher and clearing jam.

Jog-Reversing Controller permits rocking to clear jam.

Time-Delay Undervoltage Relay allows crusher to ride through momentary voltage dips.

Stall Protection — On currents greater than normal load peaks, the motor is disconnected through an instantaneous current relay.

Write for details. Explanatory material is yours for the asking. See your A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4525

ALLIS-CHALMERS

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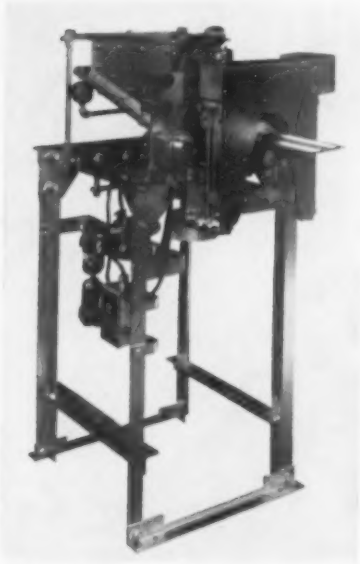
non-combustible dust and moisture are prevalent. Previous design N.E.M.A. frames 203 through 505, totally-enclosed, fan-cooled, are also available.



Valve Bag Packer

BLACK PRODUCTS CO., 135th St., and Calumet Ave., Chicago 27, Ill., has announced the Black Diamond "Airflow" valve bag packer, utilizing the Air Slide principle of conveying material. It features a weight control mechanism, and can fill bags weighing from 10 to 125 lb. packed weight. The tonnage packed per hour and packed weight accuracy depends upon the product material. A 110-volt a-c power supply operates the unit, and from 4 to 6 c.f.m. at 60 to 80 lb. air pressure are required to activate the material and operate the packer. The packing operation is said to be noiseless and vibrationless, and the bag is filled to a uniform close weight tolerance, plus or minus 2 oz.

Gearmotors

LINK-BELT CO., 307 N. Michigan Ave., Chicago 1, Ill., has introduced a line of Gearmotors and Motogears, conforming to N.E.M.A. motor sizes. Compactness is achieved through an arrangement of hardened gears, and ratio changes and simplified through the use of one low speed gear set per drive size. All operating parts are readily accessible. Quiet operation results from precision machinery and the use of rugged cast iron housings, and oil-tight design is accomplished by means of a one-piece housing with an input cover and two shaft openings. Effective seals retain oil and prevent dirt from entering the housing. An integral, positive-locking backstop is available, and can be installed without additional parts or modifications. The Gearmotors range up to 30 hp., and the Motogears up to 60 hp. Output speeds range from 280 r.p.m. down to 6 r.p.m.

Rock Drill

THOR POWER TOOL CO., Aurora, Ill., has announced the Model 77 rock drill, an improved version of the Model 75 drill. The new air-operated drill features a latch-type front head to assure a positive lock when pulling drill steels if mounted on a sinker leg. It is designed for drilling holes up to 20 ft. deep, and can be used for such heavy-duty operations as shaft sinking, quarrying, road building, etc.

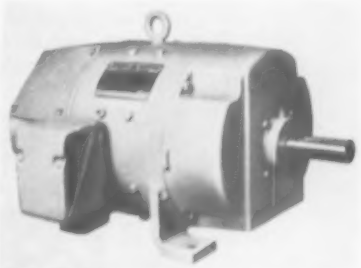
Clamshell Bucket Improvements

GEORGE HAISS MANUFACTURING CO., INC., 350 Fifth Ave., New York 1, N.Y., a subsidiary of Pettibone Mulliken Corp., Chicago, Ill., has announced several improvements in the ⅝- and ¾-cu. yd. HiPower clamshell buckets. The improvements include oversize diameter centershaft; extra heavy double-ribbed blade arms; reinforcements welded to side and back plates; and heavy duty connecting arms. All buckets are drilled for side cutter attachments.

Portable Welding Machine

AMERICAN BRAKE SHOE CO., New York, N. Y., has brought out a portable welding machine, the "MF" Welder, designed specifically for manganese steel and hardfacing work on irregularly-shaped parts. It is mounted on large industrial casters and displaces no more space than an average floor model television set. It is designed to plug into conventional a-c or d-c welding units by a single cable, and operates on a current range of from 150 to 450 amps.

A conical hopper mounted above the welding wire outlet serves as a means of storing and feeding flux. The flux adheres to the wire by the magnetic field created by welding current, and each one-quart refill from the hopper serves for 15 min. of welding. In operation, the welder produces a visible arc, unlike that of the automatic machine. The arc fuses metal and flux upon the metal being welded or built up, the flux at the same time serving as the means of obtaining the desired hardfacing composition. Thus, fluxes available include manganese steel, martensitic iron and martensitic steel.



D-C Motors and Generators

GENERAL ELECTRIC CO., Schenectady, N.Y., has announced a completely new line of direct-current motors and generators, trademarked the Kinamatic line. These units have been designed for versatility of application and performance and easier maintenance. Speed is adjustable by

"EVERY SCREEN WE ADD IS A SECO"

SAYS LUDWIG KAHLE OF PINE HILL CONCRETE

Well Known Operator Chooses 9 SECO'S To Handle Output At Three Modern Plants

"Why do we turn to SECO every time we add new screens in any one of our three big plants? I would say it boils down to just one thing . . . performance!

We average a million tons a year of material for our ready-mix concrete requirements. We have put SECO screens through tough peak season operation year after year . . . and they never say die. We have one SECO screen that has been on-the-job for 18 years. They're smooth operators, and as for accurate sizing, in my book they're the best." Ludwig Kahle, President, Pine Hill Concrete Mix, Buffalo, New York.

P.S. from your Seco on-the-job reporter.

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SECO
TRUE CIRCULAR ACTION
VIBRATING SCREENS

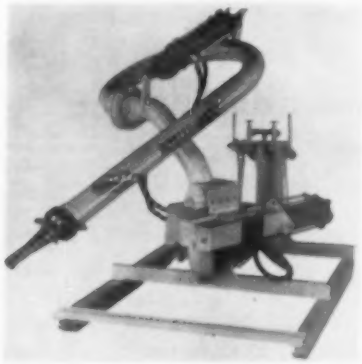
Screen Equipment Co., Inc.
Buffalo 25, New York

Overall view of one of Pine Hill's Concrete Mix Plants.

Section of Genesee St. plant showing a single deck 3' x 10' SECO scalper, one of nine SECO's serving this company.

armature voltage control, field strength control, or any combination of both. Higher base speeds are available and higher top speeds may be obtained by field strength adjustment. The Kinamatic motor can operate at any speed below base, including stalled torque. All motor ratings and accessories are available from 1 to 150 hp. and generators from ¾ to 100 kw.

The standard Kinamatic motors and generators have dripproof enclosure and are supplied with a guaranteed 15 percent service factor. Class B insulation is supplied throughout. Faster speed of response is made possible by a significant reduction in armature inertia and electrical time constant, permitting split second response for quick stops and starts. Many new features have been incorporated for easier maintenance. Brushes are easily accessible through large hand holes, and easily replaced by disengaging a special brush spring. Conduit boxes of three different sizes are available on each frame and can be located on either side of the frame. Another important feature is an average 33 percent increase in horsepower per pound.



Hydraulic Water Monitor

CHIKSAN CO., Brea, Calif., has developed a hydraulic water monitor, the Intelli-Giant MH-4, capable of throwing a 300-ft. stream through a 2½-in. nozzle tip at the rate of 2000 g.p.m. It has a horizontal sweep of 270 deg. and a vertical range of 120 deg., and operates with pressures ranging from 30 to 300 lbs. Hydraulic power is derived from the pressures of water diverted from the horizontal supply pipe near the intake. These pressures may be adjusted by control valves. The unit has a 4-in. supply pipe, and a 4-in., 270-deg. tube turn barrel which serves to minimize friction loss and balance vector forces. The hydraulic pistons, which control horizontal and vertical movement, may be removed, and the water stream can be controlled by an operator with one hand on the barrel. For remote operation, the hydraulic controls may be removed to a location several feet from the monitor. The unit is designed for such applications as hydraulic mining, slurrying, overburden removal, compaction of earth-rock fills, etc.

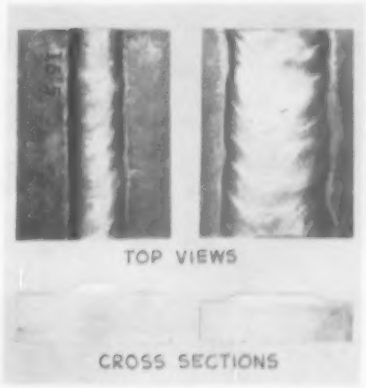
Heavy-Duty Air Compressor

JAEGER MACHINE CO., Columbus 16, Ohio, has brought out the Roto Air Plus air compressor, which delivers 365 c.f.m. It is especially useful for gunite work and heavy-duty sand blasting, or for operating a heavy-duty wagon drill and a hand-held rock drill simultaneously. Instead of the conventional 1800 r.p.m., its full load speed is 1700 r.p.m., with resultant fuel savings and lengthened engine and compressor life. Instant-acting controls, with continuous, stepless regulation of engine speed to air demands is claimed for the unit, maintaining 100 p.s.i. minimum air pressure under normal working conditions. Two-stage compression and tube finned, multipass oil cooler are said to result in air temperatures at the manifold 100 deg. cooler than in most reciprocating type compressors. Eight-hour fuel tank, adjustable radiator shutter, wrap around bumpers and automotive-type steering front axle are standard equipment.

High-Lift Loaders

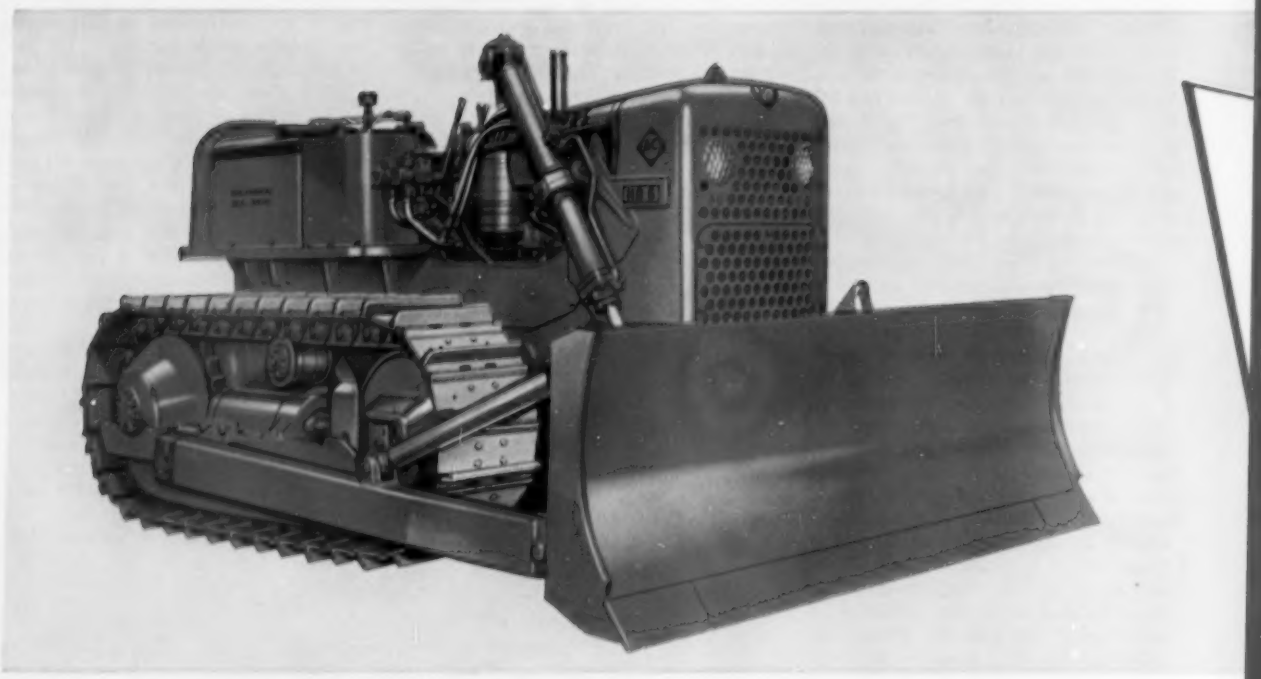
FORD MOTOR CO., Tractor and Implement Div., Birmingham, Mich., has announced step-on industrial loaders for Ford and Fordson Major Diesel tractors, featuring one-piece frame construction and high-lift with high dumping clearance. The frame design permits the operator to step on and off the tractor between the upright member and the rear wheel, instead of climbing over rear-attached implements. The loader for the Ford tractor will fit any NAA, 600 or 800 series Ford tractor, while the loader for the Fordson Major Diesel will fit any FMD tractor. The FMD loader, with a total weight of 1367 lb., has a rated capacity of 1500 lb. at a full lift of 10 ft. 7 in., and a breakaway lift capacity of 5000 lb. The rate of lift is 8 sec. at 1800 r.p.m. The Ford loader, weighing 825 lb., has a rated load capacity of 1000 lb. at a full lift of 10 ft. 6 in., and a breakaway lift capacity of 2500 lb. Rate of lift is 7 sec. at 1500 r.p.m.

Both loaders have integral bumpers built into the frame, good visibility and convenient controls. The loaders have high capacity, vane-type hydraulic pumps and full circulating hydraulic systems, with oil reservoirs built into the box frames for maximum cooling efficiency. A variety of attachments are also available for both loader units.



Hard Surfacing Electrode

THE MCKAY CO., 1005 Liberty Ave., Pittsburgh 22, Penn., has announced the first of a series of iron powder, low-hydrogen, hard surfacing electrodes, designated Hardalloy 48 Electrode. Weld metal deposited by the electrodes is said to be of the highly alloyed high-chromium-iron type and has an as-deposited hardness in excess of 55 Rc. The electrode is said to deposit metal as much as 50 percent faster than conventional types, and virtually eliminates the problems normally associated with base metal dilution. Penetration of the hard overlay material, as shown in the illustration, is at a minimum consistent with development of a satisfactory bond. Hardness of the first layer of overlay material is essentially the same as that of the third or fourth layer. The electrodes may be used with either d-c reverse polarity or a-c welding current. Although designed primarily for downhand welding, vertical welding is also possible without the need for specialized welding techniques.



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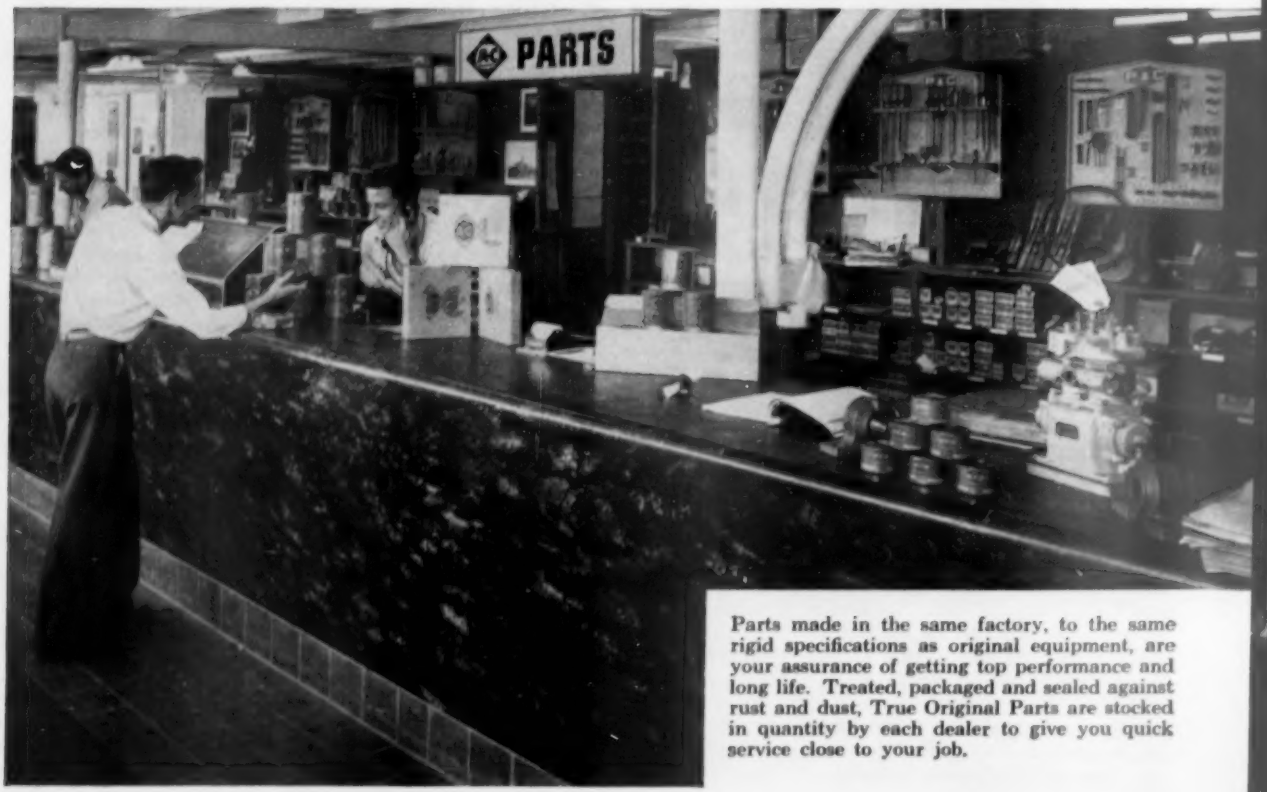

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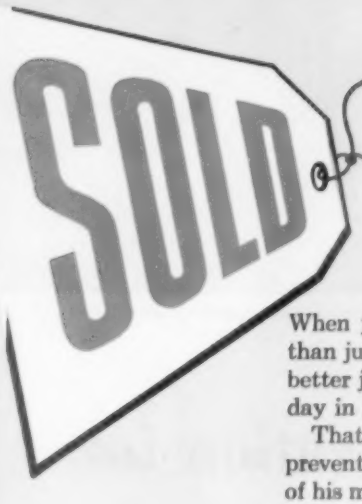

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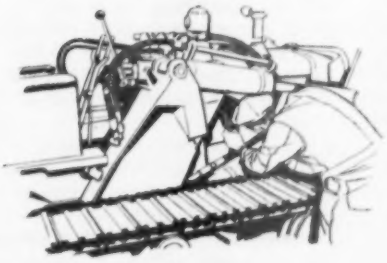

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Left: Close-up of loading hoppers over railroad tracks. **Right:** Looking down long conveyor to reclaiming tunnel. Belt conveyor from primary crusher to the right

Use OPEN-CUT Excavation for

IN THIS ARTICLE

. . . an interesting processing method is described which is used by Texas Construction Material Co., at its Alleyton, Texas plant. It involves the use of two scalping units installed at each end of a cut to insure uninterrupted operation.

By HUBERT C. PERSONS

TWO SCALPING PLANTS AND FOUR DRAGLINES at opposite ends of a cut insure uninterrupted operation of Texas Construction Material Company's largest gravel plant near Alleyton, Texas. Two draglines work only at stripping overburden. The other two draglines handle only gravel. The overburden is piled on the far side of the 85-ft. wide cut. The gravel is piled on the near side.

The four draglines, each powered with a Caterpillar diesel D17 engine, were built in the company's own shops in Alleyton. Three of the draglines have 100-ft. booms and 4-cu. yd. buckets. One has an 85-ft. boom with a 3-cu. yd. bucket.

Each scalping plant has a 5- x 14-ft. Simplicity three-deck screen. Here the gravel is desanded and given a preliminary washing. From the screens the gravel is carried on a 30-in. belt conveyor to a 21-cu. yd. trailing hopper from which it is fed by a short, inclined 36-in. belt conveyor into Euclid diesel-powered trucks. These 17-cu. yd. trucks haul the material about a mile to the main plant where the gravel is dumped through a grizzly into a 35-cu. yd. receiving hopper.

The flint-like glacial gravel runs mainly in sizes from minus 3 to 4-in. although some larger sizes are encountered. The grizzly at the receiving hopper will pass boulders up to 8½ in. diameter. The gravel is carried from the receiving hopper on a 30-in. belt conveyor, 168-ft. centers, to a horizontal stacker belt. A turnhead in the center of the stacker belt makes it reversible and permits dumping into any of the three surge piles.

Under the surge piles is a reclaiming belt conveyor tunnel, 200-ft. long and 7-ft. in diameter, which is lined with Armco corrugated steel plates. It is built on a one percent grade to

Left: Reversible horizontal stack belt conveyor and upper end of elevating stacker belt conveyor. **Right:** View of plant from surge pile; at left are loading tracks and hoppers, in the center is the main plant, and to the right may be seen the office, waste water flume and sump

Left: Main screening and crushing plant with 456-ft. belt conveyor inclining up from reclaiming tunnel under stockpiles. **Right:** One of two scalping plants with short belt conveyor loading truck

Reclaiming Sand and Gravel Deposit

facilitate drainage by gravity into a 30-in. concrete pipe leading to an old gravel cut. This pipe is also arranged to serve as an emergency escape hatch for the tunnel man.

There are three gates in the roof of the tunnel, one under each surge pile. Signals by means of a horn and colored lights, controlled by the tower operator, advise the tunnel man what size material is required. When one of the tunnel gates is opened, the gravel drops to a 30-in. Thermoid belt conveyor, 456-ft. centers which carries the gravel to the top of the plant. The conveyor is equipped with Chain Belt idlers.

The gravel is sent to two 5- x 14-ft. triple-deck Model DR Simplicity vibrating screens in the plant, with chutes arranged to pass all material over one screen or split from zero to 100 percent to either screen. Oversize material goes to one of two primary crushers which reduce it to whatever size is desired. One of these primary crushers is a 3-ft. Symons cone; the other is a 10- x 36-in. Kue-Ken jaw crusher. A 3-ft. Symons shorthead is used for secondary crushing. All screens are operated wet except a 4- x 8-ft. screen ahead of the secondary crusher.

Water is Conserved

Preliminary washing at the cuts is is done with ground water. Other water used in the main plant is from an 8-in. bore well, 236 ft. deep. Wash water at the main plant is circulated through a 1,500,000 gal. sump. Here a float actuates a 400 g.p.m. Lane pump at the well whenever the water in the sump falls below a certain level. This set-up conserves the water supply in all seasons and maintains a constant level in the sump.

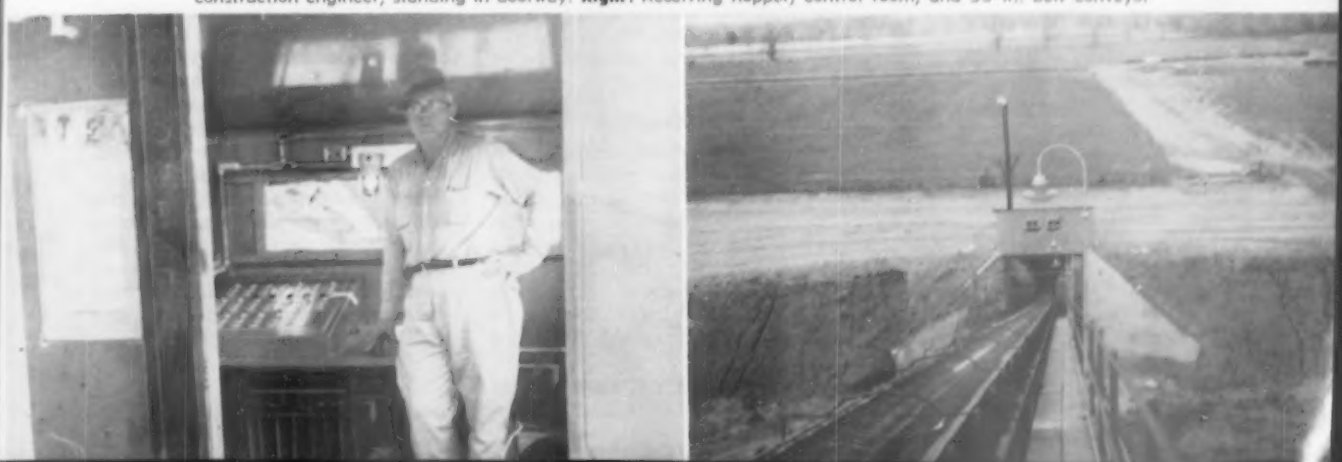
Plant capacity is 400 t.p.h. in sizes from 2½-in. down. Gravel shipped for concrete aggregate to the building market averages 1½-in. top size. Paving gravel is 2½ in. Some concrete pipe plants use ¾ to ⅝-in. gravel.

Most shipments from the plant are by rail in 54-ton hopper-bottom cars. Two loading bins, one holding 45 cu. yd., the other 37 cu. yd. straddle the plant railroad loading tracks. Cars are spotted on these tracks with a company-owned 35-ton Plymouth locomotive. Gates in the loading hoppers are controlled by a tower man who also controls the spotting of cars which are moved by cable and winch during loading, after which they are taken to a set-out track with the company locomotive to be picked up later by the Colorado River Western Railway which serves this area. A stockpile containing 135,000 tons or about 2500 cars of classified material is maintained at the plant.

Set Up Exploration Department

Texas Construction Material Co. has under lease approximately 9000 acres of land along the west bank of the Colorado River in the vicinity of Alleyton. Not all of it is known to be underlain with gravel nor has all of it been thoroughly prospected.

Left: Signal board in control tower from which red or green lights may be seen by operator in reclaiming tunnel. E. H. Lawrence, construction engineer, standing in doorway. **Right:** Receiving hopper, control room, and 30-in. belt conveyor



Interior of reclaiming tunnel showing 30-in. belt conveyor

In addition to the operations near Alleyton, the company has three gravel plants at Eagle Lake and four plants in East Texas near Cleveland. The plant at Alleyton is known as No. 23 or the Helms Plant. It was operated first with portable equipment in 1953 after several years of geological exploration revealed the location of extensive gravel deposits. These deposits are said to constitute a gravel reserve sufficient for at least 25 years' operation.

The company began prospecting for gravel in the area on a planned basis in 1947 after deposits along the east bank of the Colorado river showed signs of depletion.

A special Land-Lease Department was set up to conduct geological surveys and exploration. Currently this department is headed by E. V. Morgan with a staff of six men. The early work of the Land-Lease Department was directed by E. H. Lawrence, now construction engineer for all operations of the company.

A power-operated rotary drill mounted on a tandem axle truck is used by the prospecting crews. More than 1000 bores have been made and the results carefully mapped. The work is continuing.

The Texas Construction Material Co. was organized in 1929. It is the outgrowth of a merger of three separate companies. These were: Gemmer & Tanner, operating gravel pits southwest of Columbus, Texas and at Eagle Lake; Columbus Gravel Co., with pits near Alleyton and the Beaumont Building Material Co. with pits near Cleveland, Texas. Now the general office of Texas Construction Material Co. is in an attractive, company-owned architectural concrete building at 1919 Travis St., Houston. E. P. Gemmer is president and general manager. D. E. Baker is vice-president and production manager.

Hydraulic Pump Standards

THE 10TH EDITION of the "Standards of the Hydraulic Institute" has been published by the Hydraulic Institute, constituting an up-to-date consensus of engineering information on hydraulic pumps. It has five sections, the first of which contains general information about the Institute and a brief history of the series of publications preceding the 10th edition. Three sections are devoted, respectively, to the basic types of pumps; centrifugal, rotary and reciprocating. Each of these sections covers the classification, nomenclature, application, rating, testing and instructions for installation, operation and maintenance.

A fifth section, the Data Section, contains information on friction loss for water and for viscous liquids in pipes, valves and fittings; friction loss for paper stock in cast iron pipe; data on pipe dimensions; properties of water; viscosity of common liquids; and discussion and recommendations on materials of construction for pumping various liquids. The book is available from the Hydraulic Institute, 122 East 42nd St., New York 17, N. Y., at a cost of $4.75 in the United States, or $5.75 per copy, foreign.

Gas Sampling Device

EUGENE W. GEARY, research and development engineer for the Columbia Cement plant at East Fultonham, Ohio, has been granted a patent on a gas sampling device. It consists of a tube, an aspirator and a separator. The tube is connected to, and receives gas from the furnace or other source as a result of the pressure differential created by the aspirator. It is claimed that the device permits a gas sample to be removed from a furnace or kiln with a minimum of corrosion due to accumulated sludge. It requires no filters or pumps, has few moving parts, and is simple in design.

Special Consultant

R. B. FULLER, Mulberry, Fla., has been appointed special consultant to the phosphate minerals division of International Minerals and Chemical Corp., Chicago, Ill. He has been associated with the company since 1925 and has been assistant to the vice-president in charge of the phosphate minerals division since 1953. Previously he was manager of the Florida phosphate department. In 1951, Mr. Fuller received an honorary degree of doctor of laws from Florida Southern College, Lakeland, Fla., for his contributions to the growth of the phosphate industry in Florida.

Asphalt Institute Engineer

JAMES C. JOHNSON, who has been on the Oklahoma field staff of The Asphalt Institute, College Park, Md., since 1951, has been assigned to the headquarters staff of the Institute to work on special problems in asphalt engineering and soil stabilization. He was formerly associated with the Oklahoma Department of Highways as a soils analyst. He received his M.S. degree in civil engineering from Oklahoma A. & M. College, Stillwater, Okla. He is a member of the American Society of Civil Engineers and the American Road Builders' Association.

Alpha Superintendent

JAMES ANDERSON has been appointed superintendent of the Cementon, N. Y., plant of Alpha Portland Cement Co., Easton, Penn. He succeeds Reed T. Recknagel, superintendent, who has been transferred to the Martin's Creek, Penn., plant. Frank Marcon, formerly plant engineer at Martin's Creek, has been made assistant superintendent at Cementon.

I.M.C.C. Promotions

JAMES F. ROE has been promoted to manager of the Florida operations of the phosphate chemicals division of International Minerals and Chemical Corp., Chicago, Ill., and Charles A. White has been appointed manager of the division's Tennessee operations. Robert V. Safford has been named assistant manager and Ralph W. Lorentz has been made plant superintendent of the Bonnie plant, near Bartow, Fla. Bryce L. Rhodes has been appointed development and production staff manager for the phosphate chemicals division in Chicago.

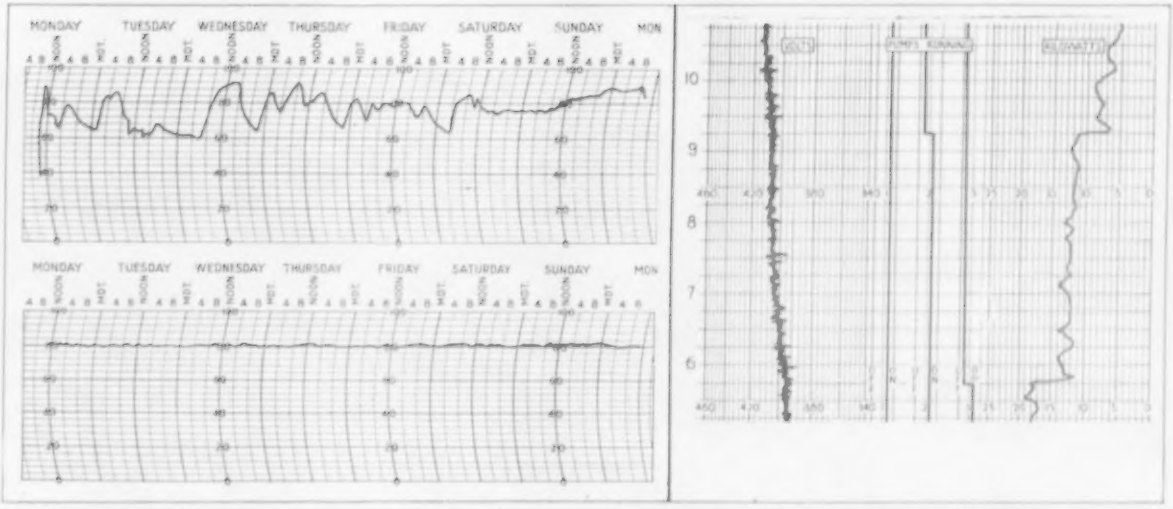


Fig. 1: Temperature records showing value of thermostatic control of heating system; top, drum chart record of outdoor temperatures; bottom, record of controlled indoor temperature. **Fig. 2:** Five-pen record from recorder on roll chart for three pumps, giving set-up voltage, pumping running hours and power, shown to the right

What to Do With CHART RECORDS from Instruments

By LEO WALTER*

RECORDING INSTRUMENTS are widely used in various branches of industry, producing a great number of chart records. The types of recorders are varied, and can provide either very quick or slow recordings of widely diversified measured or controlled factors. Recorded values range from electrical measurement of volts, watts, or cathode ray oscillograph curves to chart records of flow, temperature, pressure, pH, electric conductivity, density of fluids and many more. It is well known that the great value of diagrams obtained from measuring or controlling instruments is that in many instances chart records can be produced when human capacity for reading measured values becomes inadequate, such as for very quick events. On the other hand, by noting indicated values in a log book the plant operator would waste too much time if operational reactions proceed only slowly.

The usual chart records show a measured or controlled value as a function of time units, which latter can be split seconds, or minutes, or longer time intervals, and diagrams obtained in this way offer good evidence of events in a plant.

Evaluating Chart Records

The question is, however, what happens with these valuable records? Does plant management benefit to the full from chart readings, provided they are correct, easily legible and informative in every way? Evaluation of chart records is a very important job, and should not be entrusted to a junior member of the staff. In many plants, it is the chief engineer who scrutinizes carefully every morning all important instrument records. Any irregularity is followed up at once, and action is taken where a fault in equipment or in plant operation is suspected. At the other extreme, a young assistant is in charge of changing charts, and has been instructed to file same away, or to throw them into the waste paper basket, unless a very unusual chart record appears.

The big question is whether this can

(Continued on page 63)

*Consulting engineer, Cheltenham, England.

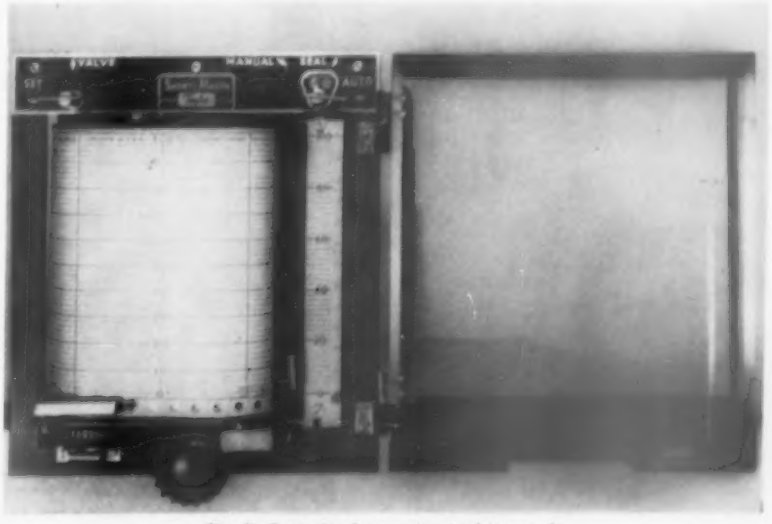


Fig. 3: Recorder for use in graphic panels

Overall view of sand and gravel plant which has a capacity of 150 t.p.h. Primary crusher is to the left; road gravel bin, desanding screen, and rotary scrubber are in the center; and the gravel screens and bins, to the right. Arrow points to centrally-located switch house. **Inset** shows part of switch house interior with start-stop buttons oriented with flow of material through plant

CENTRAL-CONTROLLED Sand and Gravel Plant Has

THE TREND TO PUSH-BUTTON PLANTS in the sand and gravel industry was exemplified recently by the Sidney Sand and Gravel Co. in its new 150 t.p.h. plant located 1 mile south of Sidney, Ohio. The installation replaces the company's original 30-year-old plant which was located at another pit site near Sidney. Deposit depletion and near-to-obsolete, low capacity (75 t.p.h.) facilities led to partial abandonment of the older operation early in 1955. The new plant, built during the spring of 1955, was started up in June.

View of plant taken from primary crusher. The sand stacker is on the left and the switch house is on the right

Designed and manufactured by Lippmann Engineering Works, the new plant is a straight-line type, consisting of a crusher run section producing road gravel, followed by a washing plant producing several sizes of gravel and concrete sand. In the road gravel plant there is a primary jaw crusher, a scalping screen which is closed-circuited with cone and hammermill crushers, and a 25-cu. yd. bin. The latter is bypassed in the production of washed aggregates. Washing and sizing facilities consist of a sand screen, screw classifier, rotary scrubber, and two gravel screens. Sand is stockpiled by a radial stacker, and a four-compartmented 160-cu. yd. bin is used for gravel storage. Belt conveyors handle intraplant transportation.

A major feature of the new operation is that all plant facilities are push-button controlled from a centrally-located ground level switch house, from which the various units can be observed. To further facilitate operation, the start-stop buttons are mount-

Above: rotary scrubber, screw classifier, and 90-ft. sand stacker with pit and office in background

Left: A 40-ton feed hopper supplies the 15- x 36-in. primary jaw crusher. Conveyor to the right, above, returns throughs from the hammermill

PUSH-BUTTON

...operation of sand and gravel plants is becoming increasingly popular in designing new and improving older units. Sidney Sand and Gravel Co., Sidney, Ohio has a centrally-located switch house that controls all operations in its new straight-line type plant.

Three Crushing Stations

By KENNETH A. GUTSCHICK

ed on a panel board in a single line and oriented with the material flow. With this automatic arrangement, one man can operate the plant; however, two men are generally used, who are stationed at the primary crusher, and the scalping screen (as a picker).

The pit and plant are located on a leased 60-acre farm site along the Great Miami River, occupying an upper terrace level of the valley. The deposit is part of a discontinuous glacial valley train, which was considered to be the best available by the company after 18 months of prospecting in the area.*

The Sidney deposit varies in thickness from 15 ft. at the north end of the property to 40 ft. at the south end; the overburden consists of 3 to 4 ft. of top soil. The plant was purposely located at the north end where the deposit is thinnest, so that the least amount of reserves would be "lost." In addition, the river wash water supply was closest at the north end; and further, the land owner, whose farmstead was located at the south end, could continue farming the property without any disruption. The deposit has a 40:60 sand-gravel ratio, which is unusually coarse for the area. Boulders up to 30-in. diameter are common.

The pit is worked with two draglines by the cut-and-fill method, each cut is approximately 15 ft. wide by 400 ft. long. A ½-cu. yd. machine handles overburden, while a 1-cu. yd. Koehring unit loads the gravel into two International dump trucks (10 and 15 ton, each). The haul distance is only 200 ft., with an inclined ramp serving the primary crusher hopper.

The material is dumped into a 10- x 10-ft., 40-ton capacity hopper fitted with grizzly bars spaced on 12-in. centers, and reclaimed by a 30-in. x 5-ft.

Left to right: Sam J. Milligan, secretary-treasurer; William Milligan, president; and Pat H. Milligan, vice-president

*According to the Ohio Geological Survey (personal communication), most of the commercial gravel deposits in the Sidney area are located in the Great Miami River valley bottom, but even here they are somewhat restricted. Farther upstream (north), the reserves are limited due to narrowing of the valley, and downstream the bedrock appears at or near the surface. Within the valley, the better deposits are generally concentrated in an upper terrace level (such as the Sidney deposit), whereas the lower terraces are characterized by poorly sorted, lower grade gravels.

Gravel pit is worked by the cut-and-fill method, each cut being about 15 ft. wide. The 1-cu. yd. dragline in the background loads trucks

reciprocating plate feeder. A 6-ft. grizzly section (2-in. openings) ahead of the primary crusher rejects the fines. Syntron vibrators mounted on the hopper bottom and the crusher bypass chute facilitate movement of material. The primary crusher is a 15- x 36-in. Lippmann Grizzly King jaw, which is driven by a 40-hp. Lima motor; the crusher opening is 3-in. The crusher product and the bypassed fines join and are carried to a 3- x 12-ft. double-deck scalping screen by a 24-in. lattice frame conveyor, 100-ft. centers. Deck openings are 1⅝-in. and ⅞-in., respectively.

Both decks are used in the production of road gravel and/or small gravel sizes, whereas only the top deck is used for production of coarser gravel. In the former case, rejects from both decks are chuted to the secondary crusher, with minus ⅞-in. material being carried by a 24-in. conveyor, 45-ft. centers, to the crusher run bin or to a bypass chute leading to the washing plant. In the latter case, the scalping screen top deck rejects are recrushed and the throughs are carried to the washing plant. The secondary crusher is a 3-ft. Symons shorthead cone which is driven by a 75-hp. motor and set with a ½-in. opening. Its product is returned to the primary conveyor by means of a 24-in. inclined belt conveyor, 65-ft. centers. For further reduction the cone crusher product can be chuted from the 65-ft. conveyor to a 24- x 24-in. Eagle hammermill, which is driven at 1200 r.p.m. by a 75-hp. motor. This crusher gives added capacity in the production of No. 6 gravel (⅜-in. to 8-mesh); it also aids in the elimination of soft particles and in producing cubical materials. The hammermill product is returned to the primary conveyor via a short 24-in. conveyor.

Washing Plant

Material bypassing the road gravel bin is initially wetted in a 3-ft. wide launder chute which feeds the 4- x 14-ft. double-deck desanding screen. The latter, fitted with Link-Belt P-50800 spray deflectors, has a top relieving deck with ½-in. openings and a bottom deck with $\frac{5}{32}$-in. openings. Bottom deck throughs are chuted to a 30-in. x 25-ft. single screw Eagle classifier-dewaterer, and the finished (concrete) sand delivered to stockpile by a 24-in. radial stacker conveyor, 90-ft. centers. The latter is mounted on 70-lb. rail at a 15-deg. angle and can be swung through 210 deg.; the drive is a 2-hp. Westinghouse gearhead motor. Oversize from the sand screen is fed to a 5- x 10-ft. rotary scrubber fitted with a 3-ft. dewatering spout, and then carried by a 24-in. conveyor, 120-ft. centers, to the gravel screens. Material through the dewatering spout is piped back to the screw classifier.

Gravel sizing is handled by 4- x 10-ft. and 4- x 12-ft. double-deck screens mounted in series, the former being fitted with spray deflectors. Deck openings are 1 in., $\frac{7}{16}$ in., ¼-in., and 8-mesh, respectively, with the latter being used only for dewatering. Finished products include Ohio No. 3, 4, 6 and 9 sizes. Specifications of these products are in the table, above, (all figures are total percent passing).

	2 in.	1½ in.	1 in.	⅝ in.	½ in.	⅜ in.	¼ in.	No. 4	No. 8	No. 16
No. 3	100	80-100	20-60	0-20		0-5				
No. 4			100	80-100	20-60	5-30		0-5		
No. 6					100	90-100		10-35	0-5	
No. 9						100	95-100		0-20	0-10

Scalping screen and secondary cone crusher, in center, and road gravel bin and switch house, to the right

These products are gravity fed to a four-compartment truck loading bin, fitted with clamshell gates. Blended products, such as Nos. 34 and 46 can be made by throwing flopgates or blanking certain decks.

All plant equipment except the cone crusher, hammermill, screw classifier, and motors, was supplied by Lippmann. Conveyors are of the lattice frame type, and the belts are driven at 250 or 300 f.p.m. by 5- or 10-hp. motors. The conveyor drives incorporate Dodge Torque-arm reducers. Drives for the screens are 7½ hp. and 10 hp.; for the scrubber, 15 hp.; and for the sand screw, 10 hp. Electric motors were supplied by Lima.

Water for washing is supplied at 700-800 g.p.m. by a 5-in. Fairbanks-Morse centrifugal pump, which is driven by a 75-hp. motor. Loading from stockpile is handled by a Haiss bucket loader and a 1⅝-cu. yd. Michigan 125A front-end loader. A 45-ft., 50-ton Fairbanks-Morse truck scale is used for truck deliveries and other weighing service.

The Sidney Sand & Gravel Co. is headed by William Milligan, president, and his two sons, Pat H., vice-president, and Sam J., secretary-treasurer. The company is a member of the Ohio Sand and Gravel Association.

What to Do With Chart Records

(Continued from page 59)

be the right method of evaluation of chart records, often obtained with great expenditure on first installation cost of elaborate instruments. It may well be worthwhile for top plant management to take a special interest in this question and carry out a survey throughout the plant in order to find out what sort of chart records are obtained, of what quality they are, who deals with them, and what practical conclusions are being taken from the diagram. Many a surprise might result from this special survey. In addition to the above investigations, it is highly recommended that at least once a year, an investigation should be made to see that chart records are accurate and lend themselves to easy interpretation. This means checking and testing of plant instruments. A few points worthwhile considering are given in the following:

First, a periodic check of measurement accuracy is essential. Do not take it for granted that all measurements obtained from recording instruments are sufficiently accurate. They may deviate from the actual values, and thus give a false picture. A sluggish instrument having a large instrument time lag might fail to record deviations which are important. An oversensitive instrument might produce blurred lines, which do not allow exact readings. The remedy in the first instance is to replace the slowly acting recorder by a quick-acting sensitive instrument, perhaps of the electronic type. The second instrument can probably be adjusted, and by increasing a damping means the curves might become clear, especially when the pen and ink have been exchanged for more suitable types. Fig. 1 shows clear chart records which are excellent for evaluation.

Chart Speeds Important

In another instance, a survey disclosed that chart speeds have been wrongly chosen when installing a new instrument, and afterwards nobody took the trouble to correct the rate of chart movement. The results were badly readable chart records, mainly because of excess chart speeds. It was obvious that nobody in the plant could have given adequate attention to the records obtained, and most diagrams were useless. The influence of speed of paper movement requires careful consideration, and it should be known that high speed produces easier readability by spreading out the record. However, where only extreme values are required periodically and a general check suffices, slower speed might be adequate. Modern instruments have facilities for easy change or adjustments. Some recorders have gear wheels which can be changed; other more modern instruments such as electronic recorders allow change of chart speed by simply moving a lever in the chart drive mechanisms. It makes all the difference to have clean and easily readable charts produced from recording instruments working at the right speed, with the right type of instrument pen, and at the right pen movement. Sometimes planimeters are used for integration of diagrams; for example, for assessing the total flow volume from rate of flow records. It may often pay to relieve plant personnel from this somewhat cumbersome job by exchanging an older flow meter with a modern instrument having a totalizing counter incorporated. Some instrument makers supply a transparent reading scale to be placed over a standard chart to be used for a variety of recorders in a plant for evaluation, as shown. Chart evaluation of related values, for example steam temperature and pressure of super-heated steam,

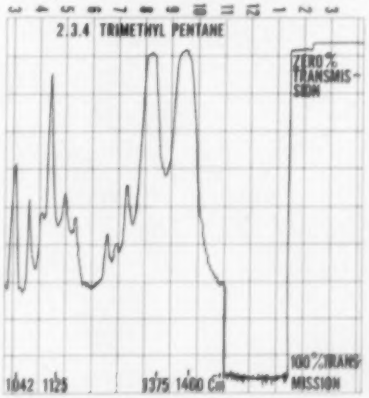


Fig. 4: Good chart record from quick-acting recorder

or of related operational values, can be greatly facilitated by using multiple-pen recorders. For example, Fig. 2 gives records of a 5-pen recorder showing on a single strip that charts six graphs of coordinated times. Multicolor recorders with circular charts can similarly have up to six values recorded on the same chart, which are related. Sometimes in two-pen recorders a crossing of two lines reveals at a glance that something has gone wrong, such as air/fuel ratio in combustion, or CO_2, content and steam pressure and the like. In instrumentation modernization it is highly advisable to have correlated values recorded on a single chart, which makes panel boards smaller. For example, in processing departments related rates of flow, liquid level, and electrical values of pump motors are valuable in records of chemical reactions. Graphic control desks are space-saving by using miniature indicators and recorders, and multi-point recorders. An additional advantage of multi-pen recorders is that the filing away of multi-point charts is easier. By choosing distinct ink colors no mistake can be made in evaluation, Fig. 3.

The evaluation of a chart record starts with a careful observation of the overall shape and change of values of a graph. It should then be followed by a detailed scrutiny of single values in the curves, with special consideration of maximum and minimum points. Observation of peaks and valleys, of the nature of fluctuations can be very illuminating, Fig. 4.

A few words should be said in conclusion. Adequacy of plant supervision depends not only on the number of recording instruments in a plant, but also on their accuracy, responsivity, on the quality of chart records obtained, and in the way in which readings from these charts are dealt with. Modern processing, efficient operation in the power and boiler house are unthinkable without the use of instrumentation, including recording and controlling instruments. By making sure that chart records produce the right kind of irrefutable evidence for efficiency, output can be kept high at low cost. Evaluation of chart records assists in achieving optimum plant efficiency.

To Build Cement Plant

ALPHA PORTLAND CEMENT CO., Easton, Penn., has announced plans to build a cement plant in Frederick County, Md., within the next two years. The company has options to purchase 980 acres of land near Adamstown, Md. J. F. Magee, president of the company, said plant construction may start this summer, and be completed early in 1958.

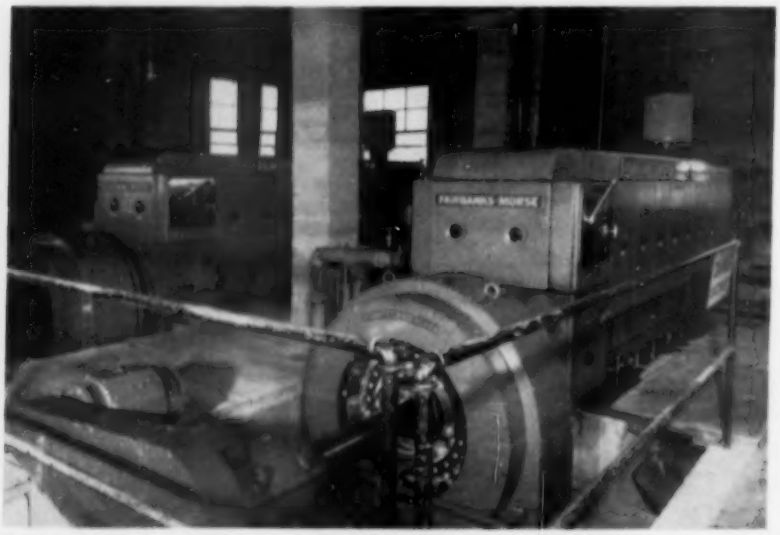
Overall view of the quarry near Gibson Station, Va., where the new diesel-electric power plant was constructed

DIESELS Cut Stone Plant Power Costs

• Two 360-hp. diesels cut operating costs at Kentucky-Virginia Stone Co. quarry, where fluctuating load and remote location placed premium price on purchased power

DECREASED OPERATING COSTS have resulted from the installation of a diesel power plant by the Kentucky-Virginia Stone Co., Inc., Middlesboro, Ky., at one of its two limestone quarries near historic Cumberland Gap. Although the power load at the quarry fluctuates widely, the two 360-hp. Fairbanks-Morse diesels deliver power at a cost well below the projected cost of purchased power and substantially lower than the company's previous steam plant operating cost.

The decision to generate company power at this quarry was made chiefly because of the high demand charges that would have been encountered had power been purchased, according to W. B. Paynter, Jr., vice-president and secretary. The motor-driven conveyors, crushers and other equipment at the quarry are operated sporadically with frequent starts and stops, which is characteristic of quarry operations, and the result is a power load marked with closely spaced peaks and valleys. Power factor penalties, due primarily to the quarry's remote location, also influenced the decision.

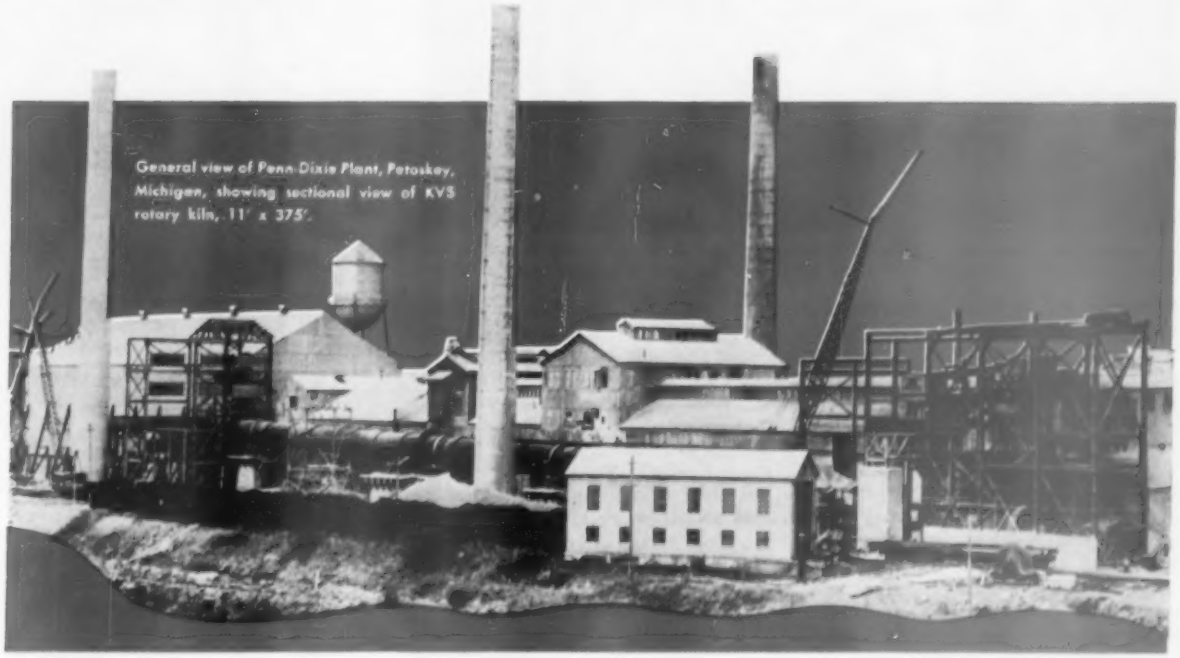


Two 6-cyl. diesel engines, each rated at 360 hp. at 514 r.p.m. and driving a 350-kv.a., 245-kw. alternator

In 1954, the two diesel engines alternated on a five-day, 40-hr. per week schedule, recording a combined total of approximately 2016 hr. of operation. In this 12-month period they produced a total of 278,950 kw. hr., representing an average hourly load at the power plant of 133 kw. Since each Fairbanks-Morse diesel drives an alternator rated at 245 kw., the load factor reflected is only about half engine capacity. Peaks ranged above 245 kw., which means that each engine was frequently called upon to operate under overload conditions and valleys often fell below 100 kw.

As a major supplier of crushed

KENNEDY MACHINERY AND EQUIPMENT DESIGNED TO INCREASE CEMENT TONNAGE AT PETOSKEY PLANT OF PENN-DIXIE CEMENT CORPORATION



General view of Penn-Dixie Plant, Petoskey, Michigan, showing sectional view of KVS rotary kiln, 11' x 375'.

Machinery and equipment for a modern plant... designed and manufactured by KVS to meet the rigid requirements of the Penn-Dixie Cement Corporation for their Petoskey, Mich. Plant.

The additional machinery includes, two-compartment Clinker Grinding Mill . . . Three compartment Raw Wet Grinding Mill . . . Rotary Kiln, 11 ft. x 375 ft. . . . Complete with auxiliary equipment. The installation of this new machinery will increase the annual rated capacity of this fine plant by 54%.

The KVS trade mark on any type of machinery used in the manufacture and processing of cement, lime, aggregates, non-metallic ores, etc., is synonymous with top quality. In use the world over, KVS Machinery and Equipment has an enviable reputation for peak capacities, economical operation, and low maintenance costs.

Let our engineers show you how KVS Machinery and Equipment will increase the output, efficiency and operating profits of your plant.

SEND FOR BULLETINS DESCRIBING KVS MACHINERY AND EQUIPMENT.

KENNEDY-VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

TWO PARK AVENUE, NEW YORK, N. Y. • FACTORY: DANVILLE, PA.

Horizontal lubricating oil cooler and jacket water heat exchanger serve the diesel engines, also shown is the three-cartridge lubricating oil filter and water softening unit

limestone for highway construction, railroad ballast and industry, the Kentucky-Virginia Stone Co., maintains two quarries in the vicinity of Middlesboro, one at Pineville, Ky., about 12 miles to the west, and another at Gibson Station, Va., about the same distance to the east. The Pineville quarry is a small roadside operation producing about 500 tons of stone per day. Power for its crushers and other motor-driven equipment is purchased from Kentucky Utilities at an average cost of 2.54 cents per kw. hr., including demand charges. In 1954 a total of 166,700 kw. hr., was purchased.

The Virginia quarry, where the two Fairbanks-Morse diesels are installed, is by far the larger of the two, producing between 1000 and 1500 tons of crushed stone per day, or more than 300,000 tons per year. Originally opened in 1913, the quarry is located on a 15-acre site in the Cumberland mountains. The Kentucky - Virginia Stone Co. acquired the site in 1929 and in 1942 stripped overburden for a second quarry at the same location.

When Kentucky-Virginia acquired title to the Virginia quarry in 1929, all crushing, elevating and screening equipment was driven through a system of main and jack shafts by a reciprocating, low-pressure steam engine. The drive was via an old-fashioned flat transmission belt. This system was continued in operation until 1944, shortly after the second quarry was opened. At this time a rocking-valve-type Corliss steam engine was installed and the original hand-fired boilers replaced with stoker-feed boilers of 100 hp., 125 hp. and 225 hp., respectively.

Steam remained the principal source of power at the quarry during World War II and throughout the early post-war years. Due principally to the rising price of coal, operating costs continued to mount from year to year.

By 1950, a post-war boom in highway construction was sweeping through the eastern portion of the country, and to meet increased demands for crushed stone Kentucky-Virginia converted its old plant into a secondary crushing unit and constructed a new primary crushing, elevating and screening system ahead of it. The new system feeds stone to a surge pile, which in turn feeds the secondary plant.

The installation of new equipment meant that additional power was needed at the quarry. After a prolonged study, company officials decided against expansion of the existing steam facilities because of the high capital investment and high operating costs involved. At the same time a study of the rate structure offered by the local power company, including demand charges and power factor penalties, convinced them that modern diesel equipment installed in a company owned and operated power plant offered the best possible solution.

Diesel-Electric Plant

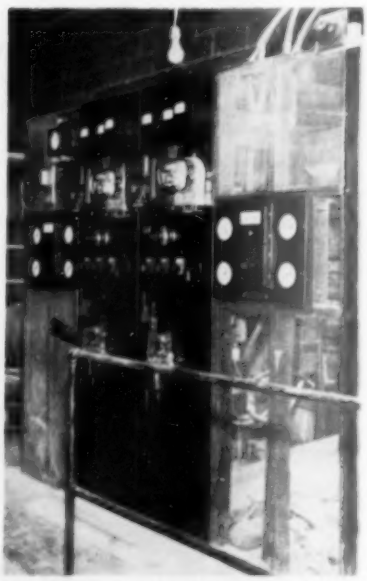
Accordingly a power plant was constructed of concrete block near the old No. 1 quarry, which had become an artificial lake, 90 ft. deep. Two 6-cylinder Fairbanks-Morse Model 31A8 ½ diesel engines were installed, each unit rated at 360 hp. at 514 r.p.m. and driving a 350-kv.a., 245-kw., 3-phase, 60-cycle, 480-volt alternator. Connected to each generator shaft by V-belt is a 5-kw., 125-volt d-c exciter. Two engines were installed to guarantee 100 percent standby capacity and to provide for future expansion.

The new power plant was completed at approximately the same time as the primary crushing system, going on the line in December, 1950. The old steam system was kept in operation until the following spring, until the necessary motors, motor controls and wiring could be installed in the converted plant. In April, 1951, the final phase of the project was completed and the two Fairbanks-Morse diesels began to carry the quarry's full load.

Fuel oil is delivered at the power plant by tank truck and is metered as it is unloaded into a 2114-gal. underground storage tank. From storage, fuel flows through full-flow strainers to the individual engine-driven supply pumps, reaching the injection pumps and nozzles through duplex, bag-type filters. There are no day tanks. Meter-oil from storage is also used in diesel-fired stoves to heat various buildings throughout the quarry.

A high-detergent type lubricating oil is circulated under pressure through the engine by built-in, engine-driven pumps. As it leaves each engine, it passes through a full-flow strainer, through a manually-controlled proportioning valve, through a shell-and-tube type cooler and then back to the engine. A by-pass on the pressure side of the engine-driven circulating pump directs a continuous supply of lubricant through a three-cartridge, cellulose-packed filter, providing added protection. So effective is this filtering arrangement that no oil change was considered necessary during the first four years of plant operation.

(Continued on page 68)



Two-panel switchboard with circuit breakers and totalizing kw.hr. meters. On each side of the board are gauge panels serving the two diesel engines. Switchboard equipment also includes exhaust pyrometers and pressure gauges

WICKWIRE ROPE DISTRIBUTORS WEAR MANY HATS

Wickwire Rope distributors are men who wear many hats. They are at home in the headgear typical of the numerous and varied industries they serve—the marine and fishing trades, the oil fields, construction, logging and many other industries having specialized wire rope needs.

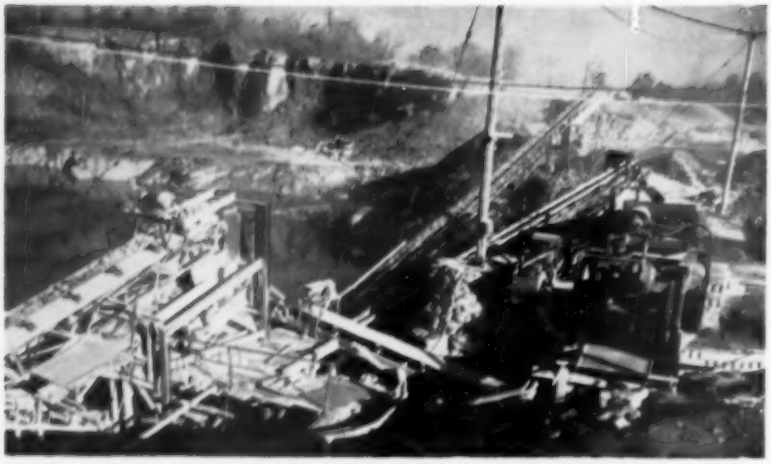
These men aren't hat models—they can wear these hats because of their long experience in the industries they serve. Add to this their intimate knowledge of local conditions and their comprehensive Wickwire Rope stocks, and you'll see that your Wickwire Rope distributor is the man who can be of great help to you.

Yes, your Wickwire Rope distributor is a good man to know. He's quality people handling quality products. Buy your wire rope and wire rope slings from him. You'll find that the many valuable services he offers far outweigh any apparent price advantage you might gain by buying direct.

CF&I WICKWIRE ROPE A CF&I PRODUCT

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

3154



Crushing and screening plant. Belt conveyor, to the left, is carrying crushed stone from the primary crusher to the two-deck screen; plus 6-in. stone is conveyed to the secondary crushing plant. To the right is the washing unit

Jacket water makeup is drawn from the nearby lake by a 2-in., 7½-hp. motor-driven pump and is treated in a water softener before being added to each engine's closed system. An engine-driven pump circulates water through each engine and through a shell-and-tube type heat exchanger for cooling.

Raw water for the lubricant coolers and heat exchangers is drawn from the same artificial lake and is collected in a 5- x 10½- x 17½-ft. hot well located outdoors against the plant's north wall. Should lubricating oil or jacket water temperature run high, the discharge from the engine-driven circulating pumps is sprayed over baffle boards which enclose the hot well on all sides. This provides the additional cooling needed.

Filtering the scavenging air for each engine presents a problem in all quarries, due to the high dust content of ambient air. Kentucky-Virginia solved this problem by mounting the impingement-type intake filters on the engine frames, rather than outside, and by changing the filter elements at least once a week. Exhaust gases are expelled through vertical silencers rising through the roof of the plant. Starting air is supplied at a pressure of 250 p.s.i. by a two-stage compressor, V-belted to a 3-hp., 1735-r.p.m. motor.

Individual gauge panels containing multi-point exhaust pyrometers and pressure gauges on fuel oil, lubricating oil, jacket water and scavenging air are mounted on each side of the plant's switchboard. The pressure gauges, with the exception of the scavenging air gauge, are double reading and can be seen clearly from the control panel of each engine. The two-panel switchboard is equipped with oil circuit breakers, voltmeters, ammeters, kilowatt meters, totalizing kilowatt-hour meters, voltage regulators and synchroscope.

This is a one-man plant, a factor which has helped minimize operating expenses. Actually, only a portion of the power plant operator's salary is charged to the operation of the two diesel engines. In the morning after putting one of the engines on the line he generally goes down to the maintenance shop where, as a mechanic, he is responsible for the service and repair of much of the quarry's equipment. Actually, if the quarry operated on purchased power, W. Guy Moore, plant operator, would be retained as a full time mechanic with no reduction in labor costs. In the meantime, the heavy-duty engines run unattended. Should jacket water or lubricating oil temperature run high, or if oil pressure should drop, an automatically-controlled siren mounted on the plant roof warns the plant operator. Each En-Bloc engine generally carries the quarry's full load for a 5-day, 40-hr. week, the second engine taking over the following week. This permits the plant operator to check each unit when he has the time, maintaining both in top operating order.

The motors used to drive the various crushers, conveyors, elevators and screening equipment at the quarry range in size from 5 hp. to 150 hp. The jaw crusher motor is 150 hp., the motor driving the hammermill in the old secondary plant is 100 hp., and the gyratory crusher motor, also in this plant, is 75 hp. Most conveyor or elevator motors are 5 hp. and 10 hp.

Quarry Crushing Plant

At this quarry, 20 ft. of overburden is removed by drilling and blasting, with diesel-powered shovels and trucks used for stripping. Wagon drills are used for primary drilling and blasted rock is loaded into 15-ton trucks by diesel-powered shovels with a 1½-cu. yd. bucket for delivery to the jaw crusher near the new power plant.

Jaw crushers reduce stone to minus 6-in. A motor-driven belt conveyor carries the crushed stone to a double-deck screen, the top deck having 6-in. openings and the bottom deck 1¼-in. openings. Oversize is returned to the jaw crusher, while throughs passing the 1¼-in. screen deck are moved by belt conveyor to a second screen with ½-in. openings for separation into two sizes, one size going to a bin holding ½-in. to 1¼-in. stone and the other bin takes the minus ½-in.

The 1¼-in. to 6-in. stone is belt-conveyed from the double-deck screen to a surge pile, which feeds the secondary crushing plant. Here four basic sizes can be prepared at one time although a total of 40 different sizes can be made.

Stone from the surge pile reaches the secondary plant through a reclaiming tunnel belt conveyor and goes directly to three reduction crushers. The discharge from the gyratory crusher is carried via a bucket elevator to a four-deck screen, while the discharge from the hammer mill and cone crushers goes to a surge bin and is then sent by belt conveyor to a five-deck screen. Oversize from the fifth deck, with 1¼-in. openings, is returned to the crushers. All other stone from the remaining screens is stored for shipment in four bins, one for ½-in. to 1¼-in., the second for $\frac{3}{16}$-in. to ½-in., the third for No. 10 mesh to $\frac{3}{16}$-in., and the fourth for 0 to No. 10 stone. Normally, the Virginia quarry maintains 10,000 to 20,000 tons of stone in storage. Out-shipments are made by truck.

In addition to the facilities described, the quarry also maintains a washing section, which is used only occasionally, according to the condition of the stone. When in operation, stone from the jaw crushers passes through a 35 in. by 30-ft. Allis-Chalmers log washer followed by a 5- x 14-ft. Allis-Chalmers low head dewatering screen. A 5-in. centrifugal pump, driven by a 65-hp., 1200-r.p.m. Fairbanks-Morse diesel engine, supplies water.

Acquires Gypsum Plant

MANAGEMENT OF THE GOVERNMENT-OWNED Atlantic Gypsum Ltd., St. John's, Newfoundland, has been taken over by Belroc Gypsum Ltd., Glasgow, Scotland, which plans to set up 15 gypsum processing plants in eastern Canada. The plants will manufacture wall panels from a powdered product for a new type house built entirely of gypsum. Three of these plants will be built in Newfoundland.

Speed and Mobility

get more work done!

Tournatractor takes the shortest route to job . . . via highway or cross country . . . cuts hours from job-to-job moves.

208 hp Tournatractor with PCU on rear can be hooked up to pull scrapers, rooters, and rollers.

Rubber tires do not damage rails or ties... unit can switch up to 10 fully-loaded railroad cars at once.

Whenever your application involves scattered job assignments, Tournatractor's 19 mph forward speed and extreme maneuverability cuts moving costs and reduces the non-pay hours of moving time. Big, low-pressure tires let you drive Tournatractor anywhere. For long moves, you save time, bother, and expense of locating a trailer, moving in extra manpower and transport equipment, loading and unloading.

Speed on the job

Tournatractor pulls, dozes, pushes at working speeds 2 to 3 times faster than crawler tractors. You have 3.69 mph in second gear, 8.38 mph in third, compared to crawler speeds of around 2 mph in second, and 3 mph in third. Tournatractor travel speed of 19.23 mph compares to the crawlers' top ranges of 4 to 6 mph. You change gears instantly . . . waste no time shifting.

8 mph reverse speed

High reverse speeds give a very important time-saving advantage to tractor-on-rubber. Nearly 50% of your working cycle on dozing or pushing jobs is usually spent backing up. Tournatractor's reverse speed cuts crawler backing up time by almost 25 to 50%. Crawler highs in reverse range from 3.1 to 6.2 mph. Tournatractor high in reverse is 8 mph.

Instant shifting

Constant-mesh transmission aids high-speed performance by eliminating delays in changing gears . . . saving vital momentum . . . gives you any gear ratio instantly. Tournatractor works in higher gear ratios because there is no loss of momentum for shifting. Torque converter increases this advantage by giving you wide automatic over-lapping of gear ratios, without depending on operator to jockey levers to get the most effective ratio of power and speed to load.

Ample flotation and traction

2' wide tires stay on top of soft ground instead of digging in. Lugs bite into underfooting to give traction. Tire pressures as low as 20 lbs. absorb shock. Rolling action compacts loose materials far more effectively than crawlers.

Lower maintenance

There are 4 easy-rolling-wheel-assemblies as compared to more than 500 wearing parts in standard track-assemblies. This means less maintenance. Dollar-wise this reduction in maintenance time can mean a saving of $3 per hour in operating expenses.

Easier to operate

Fingertip electric controls work at the flick of a switch. Steering, raising and lowering the blade, and operating the power-control-unit are all handled by buttons on dashboard. There are no levers, wheels, or other manual controls to handle. Big, low-pressure tires greatly reduce jars and jolts, stress and strain, on both operator and machine.

Interchangeable equipment

Adding to Tournatractor's versatility are a number of interchangeable attachments . . . Bulldozer, Angledozer, Root Rake, Snow Plow. This versatile tractor can also be equipped with a Push-Block, Logging-Winch or Tree-Pusher for additional applications. Drawbar and PCU are available for hauled equipment. Electric-control, open-top scrapers are also available for use with Tournatractors.

Find out for yourself how Tournatractor's go-anywhere mobility and 19 mph speeds can help you get more work done. Compare this rubber-tired tractor alongside your present crawlers. Write or call for a demonstration.

Tournatractor—Trademark Reg. U.S. Pat. Off. T-926-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

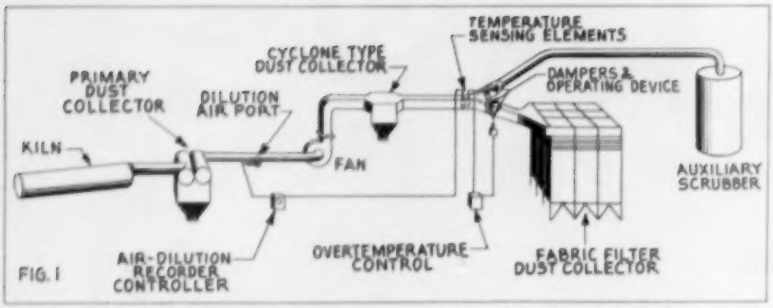


Fig. 1: Dust-laden gas leaves kiln and first passes through a primary cyclonic type collector. It is then tempered with cool air by an automatically regulated dilution damper ahead of fan. Final dust collection is in the fabric type dust collector

• Combination of cyclone type collectors with fabric filter type for final removal of dust in kiln gases results in high efficiency

ELIMINATING DUST From Kiln Discharge Gases

NO VISIBLE AMOUNT OF DUST escapes a new type dust collecting system installed by the Cadillac Asphalt Paving Co., on its Heatherington and Berner plant.* During operation essentially 100 percent of the dust is filtered out by passing the kiln gas through dense wool felt $\frac{3}{32}$-in. in thickness. The Hopkins Volcanic oil-fired kiln handles 230 t.p.h. of crushed stone and sand which is heated from 350 to 400 deg. F. with 28,000 to 31,000 c.f.m. of dust-laden gas passing through the kiln.

Wet dust collection systems had been tried without success. As this plant reheats stone and sand that has previously been dried, the dust load in the gas leaving the primary collectors is quite high — in the range of 8 to 16 grains per cu. ft. Centrifugal collectors and wet scrubbers, even though of efficient design, had effluent concentrations varying from 0.5 to 1.0 grains per cu. ft. Since 94 percent of the dust was smaller than 10 microns in size, that left a pretty dirty stack. While heating pre-dried stone and sand produced a heavy dust load, it also resulted in a low moisture content in the gas stream that was favorable to fabric collectors.

In most bituminous mix plants, the kiln is used to both dry and heat the stone and sand. If the gas leaving the kiln is diluted to reduce the temperature to 180 deg. F. to permit use of a fabric collector, the dew point of the gas leaving the kiln is still about 150 deg. F. This is an uncomfortably low differential when it is considered that the plant is not in continuous operation. When the kiln is used only to reheat the stone and sand, the dew point of the exit gas is about 100 deg. F. when the gas temperature is about 180 deg. F. This greater spread makes it possible to operate a filtering collector without fear of "mudding up" the filtering fabric, despite frequent kiln shutdowns.

How System Operates

Referring to Fig. 1, it will be noted that the dust-laden gas leaves the kiln and first passes through a primary cyclonic type collector. The gas is then tempered with cool air by means of an automatically regulated dilution damper ahead of the fan. The temperature control point for this damper is located close to the Dualaire, reverse-jet dust collector inlet to assure gas temperatures under 180 deg. F. at that point without excessive air dilution. A Foxboro recorder controller maintains a permanent record of the temperature at this point and also regulates the air motor that positions the air dilution damper. Following the air dilution damper is the main fan. Both the fan and Multiclone collectors serve as mixers with the result that there is no change of strata of gas entering the Dualaire at too high a temperature.

The combination of collectors from this point on may appear complex, but their inclusion was dictated by a need for an auxiliary system that might be used during special periods when wet materials must be fed to the kiln. During these periods the dust collecting system consists of a Multiclone and a scrubber. During normal operations, the collecting system consists of a Multiclone followed by a Dualaire reverse-jet dust collector. Both the Multiclone and Dualaire collectors are standard equipment designed and built by Western Precipitation Corp.

The Multiclone is a Type 9VG10, small diameter, multiple-tube cyclone, size 70-7, and serves as the secondary mechanical collector. Almost complete collection of particles above 10 microns and a large portion of the remaining particles are collected by this unit. The Multiclone reduced the dust load from 8 to 16 grains per cu. ft. to about 1.4 to 1.8 grains per cu. ft.

Final cleanup of the dust is accomplished by the Dualaire dust collector, designated as three units, three sections, type HR-4-W, size 4-20-19. There are four felt cylinders per section, each about 20 in. in diameter, and the effective length of each is approximately 19 ft. This collector is made up of modular components. Each module is designated as a section. To suit the capacity requirements of a specific application, sections are combined to form a unit. All sections in a unit share a common drive system. If a gas volume requirement or the space configuration dictates, several units are joined to form the installation. This particular installation is made up of nine sections in an arrangement consisting of three sections in each of three units. Fig. 2 shows how dust is separated from a gas stream by filtering the gas through dense wool felt.

The porosity of the fabric is main-

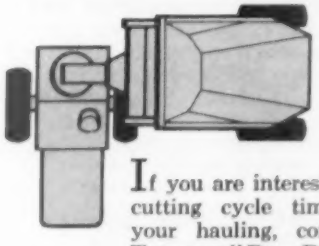
(Continued on page 118)

*From a paper presented before the Air Pollution Control Association by S. G. Hayes, N. M. McGrane, and D. B. Perlis.

90° turns . . .

give faster cycles and easier spotting

Tournapull Rear-Dump's short-turn radius saved construction of expensive turn-arounds in this 26' wide, 165' deep railroad cut. With body raised, as shown, "C" easily made non-stop U-turns within the narrow area.



If you are interested in cutting cycle time on your hauling, consider Tournapull Rear-Dumps.

These units make a non-stop U-turn by power steer in less than their own length. They eliminate time normally wasted shuttling back and forth to turn in narrow quarters. They also frequently eliminate skid-plates or expense involved in construction of special turn-around areas.

Where space is unlimited, 90° turnability still gives you faster cycles. At the shovel, fast-maneuvering Tournapull Rear-Dump swings in and positions quickly. Loading unit need not sit idle while hauler operator wastes time on a wide sweeping turn and then a long, slow back-in. Quick, safe spotting saves additional time on the dump.

Simplicity reduces maintenance

A great deal of the expense involved in maintenance is also eliminated because of the simplicity of the Tournapull turn mechanism. Steering involves only an electric motor connected to a ring gear and kingpin shaft. A flick of the finger activates the motor and causes prime-mover to pivot up to 90° around trailing unit. Turns are made quickly regardless of footing. There are no front steering knuckles, no reach rods, no complicated mechanisms to get out of line, maintain, or repair.

Now available with optional tailgate.

Check these and all the other advantages of Tournapull Rear-Dumps. See for yourself how they speed cycles and cut costs. Write or call any time for owner-verified production studies and specifications. There's no obligation.

Model	Capacity	HP	Overall Length	Width req'd, non-stop 180° turn	
				Travel position	Dump position
D	11 tons	138	25'2"	24'8"	19'2"
C	22 tons	208	30'	28'8"	20'8"
B	35 tons	293	37'3"	35'	27'

These features, too, can help on your job

Hauls anywhere — Big single low-pressure tires let Rear-Dumps safely travel narrow haul roads, paved highways, city streets . . . haul cross-country over roughest terrain, through muck and soft fills.

Reduces maintenance — Because these Rear-Dumps have no jack lines, no long drive-shaft, no frame, subframe, springs or tie rods, most common troubles of conventional rear-dump haulers are eliminated.

Dumps fast, clean — Flick of switch activates hoist motor. Body lifts quickly to any desired angle for spreading on run. At full dump position, bowl-lip is behind rear wheels so dump can be made clean over bank. Streamlined body sheds material readily.

Cuts weather delays — Power-transfer differential automatically applies power to drive wheel on firmest footing . . . pulls unit through mud, sand, soft materials which stop ordinary haulers. It's a Tournapull exclusive.

Resists body shock, damage — Three-layer, all-steel, grid-type bowl with tool-steel floor resists loading shocks. Big, wide bowl opening is easy target for any loading unit.

Improves safety — Multi-disc air brakes have more braking surface on one wheel than most haulers have on all 4. Low center of gravity, good visibility, front-wheel drive, easy control all contribute to maximum safety.

Delivers full power — Torque converter (optional in C size) automatically balances load and torque so you get full horsepower always. Lugging is reduced; shocks in transmission and final drive virtually eliminated.

Reduces fatigue — Big low-pressure tires and air-foam cushion seat smooth out ride for operator. Electric push-buttons control power steer and 2-way power dump. Eliminated is all manual work of fighting balky levers.

Insures future earnings — Behind Tournapull prime-mover, you can interchange rear-dump with scraper, bottom-dump, crane, flatbed. These trailing units lower your investment, let you handle any future job efficiently, help you keep your Tournapull profitably busy the year-around.

Tournapull—Trademark Reg. U.S. Pat. Off. 8-792-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Barge-loading and packing facilities. The two low silos to the right of the bucket elevator are for cement

• Permanente Cement Co. distribution plant at East Pasco, Wash., receives cement from California mill. Total truck and water haul is 1025 miles

By WALTER B. LENHART

CEMENT Distribution Plant Served By Barges

TO SUPPLY THE RAPIDLY EXPANDING REQUIREMENTS of eastern Washington and Oregon territory served by the Tri-City area — Pasco, Kennewick and Richland — Permanente Cement Co. installed a 7000 bbl. cement distribution plant at East Pasco, Wash.

The plant is strategically located on the bank of the Snake River, a short distance upstream from where it empties into the Columbia — or did, for now, that junction is a part of the lake formed by the backed-up waters from McNary Dam. The site was chosen because of its easy accessibility to the marketing area, and because it permits the use of the highly efficient barge delivery system — a system thoroughly tested during the construction of McNary Dam, when millions of barrels of cement were transported by barge up the Columbia to the project from Permanente's Portland facility.

Cement distributed from the East Pasco plant is produced at Permanente's 7,000,000 bbl. capacity plant near San Jose, Calif. — the West's largest cement plant — now in the process of expansion to an annual total of 8,400,000 bbl. by the addition of a sixth kiln. It is barged up the Columbia River from the company's downstream terminal at Portland, Ore., a haul of about 225 miles, including passage through the locks at Bonneville and McNary Dams and the Celilo canal at The Dalles.

The Portland distribution plant, with a storage capacity of 102,000 bbl. of bulk cement, is supplied by water transportation in company-owned bulk carrier ships, SS PERMANENTE CEMENT and SS PERMANENTE SILVERBOW, with bulk cargo capacities of 40,000 bbl. and 58,000 bbl., respectively. The ships operate from Permanente's main shipping terminal at the port of Redwood City, Calif., which is supplied by truck from the Permanente producing plant, about 18 miles away. The total mileage required to move cement from Permanente to the East Pasco silos, including the truck haul and two water hauls, is about 1025 miles.

Tidewater-Shaver Barge Lines handle all shipping arrangements from the time the cement is loaded into barges at Portland, until it is delivered to the customer at East Pasco. The barges haul up to 4000 bbl. per trip, and are unloaded by one of two Fuller-Kinyon cement pumps to two steel silos, or direct to the service bins. A St. Regis packer is installed at the plant for sack deliveries.

Reclaiming from the silos is handled by Fuller-Kinyon Airslides delivering to a bucket elevator serving the St. Regis packer, or to loading chutes for delivery into bulk trucks or rail cars. The plant and its equipment was formerly used by Permanente at Kodiak, Alaska, and was transferred complete to the East Pasco site. This plant supplies the customers cement in bulk and in paper sacks by truck and by rail. The Spokane, Portland and Seattle Railroad spur serves the plant.

Tidewater-Shaver Barge Lines also haul bulk oil and other commodities on the river, often in the same barge train with the cement shipments, so an accurate time factor for the round trip is difficult to determine. It is estimated, however, that a round trip takes about a week.

Permanente's Northwest Division headquarters, covering Washington, Oregon, British Columbia, Idaho and Alaska is located in Seattle, Wash., under the direction of E. H. Kendall, division sales manager. Customers in the Tri-City area are serviced by H. M. "Mel" Fisher, Permanente sales representative, who makes his home in Kennewick, one of the Tri-City communities. Local calls are handled by the barge company representatives, who maintain offices at the Tidewater Terminals on the Snake River, about four miles from Pasco.

Increase Clay, Shale Research

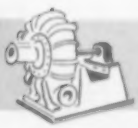
AN INTENSIFIED RESEARCH PROGRAM aimed at broadening information about expanded clay and shale aggregates was approved at the annual meeting of the Expanded Clay and Shale Association, held at the Roosevelt Hotel, New Orleans, La., in conjunction with the N.C.M.A. convention, January 23 through 26. The Technical Problems committee, headed by H. O. Pommer, Memphis, Tenn., was authorized to carry out plans to develop additional data on aggregates. This program will involve cooperation with aggregate producers in various geographical areas of the United States and in other countries including England and Canada.

The association elected the following officers to serve in 1956: William F. Atkins, Lansford, Penn., president; R. A. Utiger, Denver, Colo., vice-president; Ron G. Hardy, Warners, N. Y., secretary-treasurer. T. R. Berger, Allentown, Penn., was re-elected executive secretary.

Traffic Manager

ALLEN W. THOMPSON has been appointed traffic manager of the Cleveland Quarries Co., South Amherst, Ohio. He has been associated with the company since 1926 and succeeds Fred Bauman who retired in 1951.

Another Customer Speaks



Lets Listen in

ON A LONG-DISTANCE TELEPHONE CALL

Thomas Foundries' Engineer: "Hello, Mr. Sand and Gravel, you have now been operating your small Thomas DURABLE Dredge Pump for several months. How is it performing?"

Mr. Sand and Gravel: "Well, it seems to be doing a good job. We have no complaints."

TFE: "Are the running parts showing much wear?"

Mr. S & G: Oh, it must be all right. Production is OK. But I haven't looked inside!"

TFE: What! A sand and gravel pump under your operating conditions should be inspected regularly."

Mr. S & G: "Well, you told me that your pump would last longer, that it is made of improved materials. That's the reason I bought it."

TFE: "Yes, that's true. But any sand and gravel pump should be regularly inspected. What about production?"

Mr. S & G: "It's OK but I seem to be having a h - - of a time getting four cars of pea gravel per day."

TFE: "How is that? That's not so good."

Mr. S & G: "No, maybe not, but I couldn't get but three cars of pea gravel a day before I installed your pump. Come by and see me. I will give you details and show you what we are doing. Goodby."

This is almost a verbatum report of an actual conversation. The name and location of this experienced, long-established sand and gravel producer will be given on request.

Time marches on. Now, three years later, Mr. S & G has installed two more Thomas Pumps—one replacing a Cast Iron Pump and the other a Manganese Pump. He is now happy with three efficient, long-lived, low-cost Thomas Pumps. They are made of that extremely hard metal—genuine, abrasion-resistant Thomas Ni-Hard.

YOU CAN'T BUY AT ANY PRICE A MORE DURABLE PUMP THAN A "THOMAS" FOR SAND AND GRAVEL—YOU CAN'T BUY ONE THAT WILL MAKE YOU AS MUCH MONEY.

THOMAS FOUNDRIES, *Inc.*

P.O. BOX 1111 . . . . BIRMINGHAM, ALABAMA

COST-CUTTING Drilling Practices

• Calaveras Cement Co., San Andreas, Calif., uses a large electric rotary drill for primary drilling and mobile drill for secondary drilling. Drop ball is employed for secondary breakage

By WALTER B. LENHART

Rotary drill which drills 9⅞-in. hole. Can drill up to 12¼-in.

ROCK DRILLING PRACTICES introduced in portland cement company quarries in the western states during the past year have speeded up operations and lowered overall costs.

Three portland cement companies in the area adopted the use of the Travel drill for secondary drilling. This mobile drill has reduced the number of jackhammer operators from as high as seven to one operator.*

Another important step in the direction of more efficient quarry operations was the purchase by the Calaveras Cement Co., San Andreas, Calif., of one of the new, heavy duty rotary drills manufactured by the Bucyrus-Erie Co., designated as 50-R.

*Performance data published ROCK PRODUCTS, March, 1953, p. 91 and August, 1955, p. 136.

The No. 4 quarry of the Calaveras Cement Co. is a pit-type operation. Stripping operations are considerable, the limestone being interbedded with quartzite, cherts and shales that range from granular to the toughest of rocks. The limestone dips under the siliceous rocks that often have to be drilled and blasted before stripping. The quarried stone is high calcium limestone. A total of 10,000 tons of rock per day is handled, of which 6000 tons are strippings. The haul from the quarry to the plant is 5.5 miles over a company-owned road with a 17-unit fleet of trucks, each carrying payloads up to 30 tons. The haul is downhill in favor of the loads.

How Large Drill Is Operated

The 50-R is a crawler-mounted, electric-powered rotary drill that has a pull-down sufficient to drill 12¼-in. dia. holes although drill operators have not gone above the 9⅞-in. dia. holes currently used. The 50-R Bucyrus-Erie uses a motor-generator set and d-c drive motors with Ward-Leonard controls. Oil-operated levelling jacks and outriggers are employed. The 50-R drills through a tapered API joint at the top of the drill pipe. Round drill pipe is used. The drive motor is mounted on an assembly at the top of the mast and follows the drill down. By this scheme it is possible to drill

Shovel loading haulage units in No. 4 quarry. Note mobile crane with drop ball, to the left

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33 ft. without stopping. This contrasts with more conventional models that use a square "kelly" and the pull-down is through a grip arrangement that takes a new bite about every 4 ft. The 50-R has a high mast that stays up at all times, and is not lowered except for major moves. For moving the drill around the quarry, power and other lines must be mounted high enough for the mast to clear. The drill platform includes a drill rack that holds four lengths of drill steel. The operator, through suitable motor controls, can add a length of pipe, and screw it tight mechanically without a helper. However, the Calaveras quarry operators have a helper available.

Some tabulated data relating to this drill is as follows:

Rated hole diameter	9⅞-in. to 12¼-in.
Weight	56 tons
Length	35-ft. 10-in.
Width of crawlers	10-ft. 9-in.
Width of crawler treads	2½ ft.
Mast height above ground	64 ft. 2 in.
Connected hp.	342½
Compressor rating	1280 c.f.m.
Drill pipe	7 to 8⅝-in. round
Cost, F.O.B. San Andreas	$105,850

The Calaveras Cement Co.'s quarry equipment also includes 29-T Bucyrus-Erie churn drills using a 9-in. chisel bit, so comparative drilling rates are available and are appended.

Drill Bit Experience

Several types of bits have been used on the 50-R among which can be mentioned: the W7R, a 9⅞-in. dia. Hughes bit in which the air passes through ports at the center of the bit; the W7RJ, a Hughes bit of the same diameter as above but with air ports at the periphery of the bit; and the R-1, a carbide faced rotary bit.

Data available as to the relative merits of the W7R and the W7RJ show little difference in their performance, but it was pointed out that more comparative work should be done to clear up this point. The R-1 bit showed marked superiority in all the rocks, including the cherts and quartzites in the Calaveras quarry. In some of this tough rock, the W7R bit drilled as little as 2 ft. before being worn out, while the lowest footage of the R-1 bit was 325 ft. with an average footage for all types of rocks of 1082 ft. It was demonstrated at this quarry that the larger the bit, the greater the footage obtained both per bit and per shift.

Joe Kiley, safety engineer, left, and **L. S. Allsman,** quarry superintendent, right

This is attributed, in a measure, to the greater room for bearings, stronger teeth and more over-all ruggedness. A tungsten carbide bit costs $1100 for the 9⅞-in. dia. but will deliver footages that make it more economical in the long run. The tri-coned bits used are manufactured by the Hughes Tool Co.

Comparative Cost and Performance data on the drills and bits used at the Calaveras Cement Co., No. 4 quarry, San Andreas, Calif., are shown below:

The 50-R drill is supplied air by two Gardner-Denver compressors that deliver 1280 c.f.m., and are driven by two 125-hp. General Electric motors. Roto-Clone collectors on the drill take care of dust from the operation. Controls on the drill permit the operator to rotate the drill from 40 to 200 r.p.m., and to increase or decrease the pull-down pressure. The 50-R now does about 95 percent of the drilling at the quarry.

Blasting Practices

The limestone at the No. 4 quarry of the Calaveras Cement Co., the main producing pit, is a somewhat marbelized limestone, white in color and fragmentation is not a problem. In blasting, the 9⅞-in. holes resulted in 35 tons per foot of hole as compared to 18 tons for the closer spaced 7⅞-in. holes. Holes of the larger diameter are spaced on 21-ft. centers and 21-ft. burden compared to 15-ft. centers for the 7⅞-in. dia. holes. Explosive consumption for both holes was about the same and was slightly less than 0.8 lb. per cu. yd. Explosives used are all Hercules 60 percent Hercomite and Gelamite. As some water is in the pit, a gelatin-type explosive is necessary. About 40 percent Gelamite and 60 percent Hercomite are used. Water in the pit is removed by a Byron-Jackson pump. The explosive comprises 9-in. dia., 50-lb. sticks. Up to five rows of holes use Primacord and an instantaneous cap. The second row uses a du Pont MS connector (.017 sec. delay). The other rows of holes are also fired with this delay.

Four Bucyrus-Erie shovels are available for loading, including two 120-B with 5-cu. yd. bucket; 85-B with 3¼-cu. yd. dipper; a 75-B and a 50-B with 2½ and 2- cu. yd. buckets, respectively. The latter two are mainly for standby purposes. The truck fleet includes: 13 rear-dump Euclids hauling a 25-ton load; one 20-ton, one 25-ton and five 35-ton Autocars, and one 35-ton side-dump Sterling truck. A No. 41 Lorain Motocrane with a 5000-lb. drop ball is available for secondary breaking.

Make White Cement

In the grinding of white portland cement, steel balls are now being used with the iron removed by a drum-type magnet. White cement is made during the winter months only and on a campaign basis. The new flotation and beneficiation plant of the Illinois Glass Co. and Gladding McBean Co. at Ione, Calif., is only a short haul from the San Andreas cement plant. It was indicated that an iron-free alumina and a low iron silica might later be secured from that operation thereby simplifying the technique at the cement plant, without sacrificing any of the high qualities of the white cement made by the Calaveras Cement Co.

Personnel

L. S. Allsman is quarry superintendent. Grant W. Metzger is plant manager. Thomas L. Love, Sr., is supervisor of administrative services, all located at the plant. Joe Kiley is safety engineer. Mel Sutton is chief chemist. The main offices of the company are in San Francisco. Wm. Wallace Mein, Jr., is president, and vice-presidents are Arnold Ross, Mel J. London, and E. M. Barker. L. A. Parsons is consulting engineer.

Drill	Bit			Rock	Number of Bits	Number of Shifts	Feet per Bit	Feet per Shift	Cost Per Foot				Cost per Ton
	Type	Size	Cost						Bit	Labor	Power	Total	
29T	Chisel	9 in.	$540 (1)	Average	Several Years Operation		1680	17	$0.32	2.12	0.08	2.52	.072
50-R	W7R	9⅞	$201	Average	8	33	1657	151	0.12	0.25	0.20	0.57	.016
50-R	W7RJ	9⅞	$234	Average	5	42	1294	154	0.18	0.25	0.19	0.62	.018
50-R	W7R	9⅞	$201	Hard	10	14	139	100	1.45	0.38	0.30	2.13	.061
50-R	R1	9⅞	$1227	Hard	5	47	1082	116	1.13	0.33	0.26	1.72	.049
50-R	W7R and W7RJ	9⅞	$210	Average and Hard	18	89	715	145	0.29	0.26	0.21	0.76	.022

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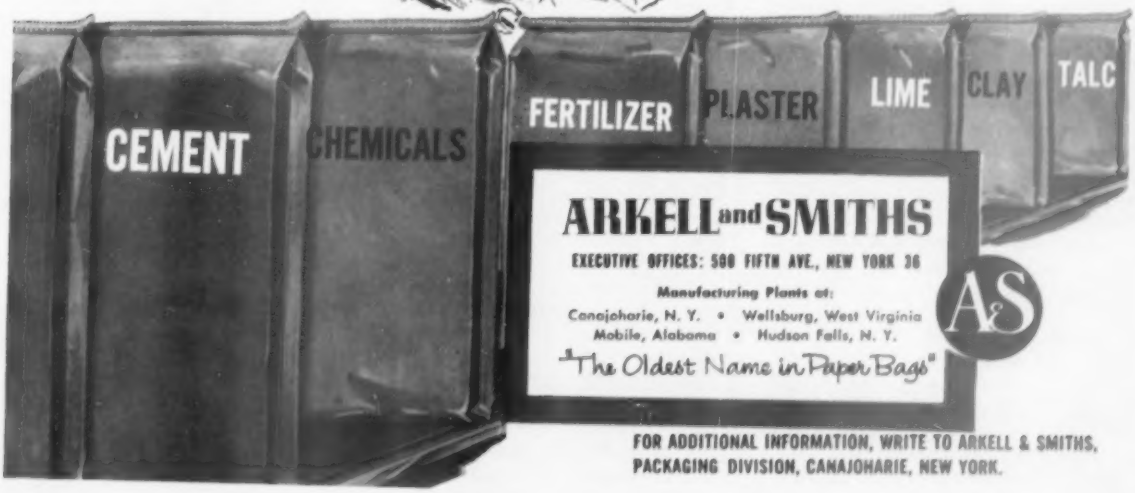

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Recent Technical Developments In

PROCESSING SLAG PRODUCTS

• Second article of series deals with the use of slag in the cement industry for the production of various types of slag-portland cements and their characteristics

By B. M. PEARSON*

BY VIRTUE OF ITS CHEMICAL COMPOSITION and characteristics rapidly cooled, basic blast furnace slags are to be regarded as suitable for low-lime cements. They are particularly suitable

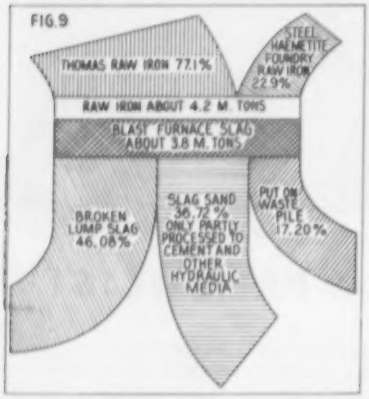


FIG.9
THOMAS RAW IRON 77.1%
STEEL HAEMETITE FOUNDRY RAW IRON 22.9%
RAW IRON ABOUT 4.2 M. TONS
BLAST FURNACE SLAG ABOUT 3.8 M. TONS
BROKEN LUMP SLAG 46.08%
SLAG SAND 36.72% ONLY PARTLY PROCESSED TO CEMENT AND OTHER HYDRAULIC MEDIA
PUT ON WASTE PILE 17.20%

Fig. 9: Blast furnace slag production in Germany and uses in 1948

raw and additional material for the production of cement and other hydraulic bonding materials. Only a very limited portion of the blast furnace slags which are produced are processed to cement or other hydraulic bonding materials. By far the greatest amount is put to other uses or is even placed on the waste pile. Enormous amounts of thermal energy are lost because of improper employment of blast furnace slag. It has been previously calculated by R. Gruen (Stahl und Eisen, vol. 63, pp. 478-80) and by W. Anselm (Zement, vol. 32, pp. 205-209) that the useful heat of a slag suitable for cement production amounts to 1.6 to 1.8 million k.cal./ton. Practically this signifies that with each ton of cement addition slag which is not used, about 250 kg. of coal are lost.

As an example of blast furnace slag economics, it is shown in Fig. 9 that in Germany in 1948 only about a third of the total amount of slag produced was being processed to slag sand and this third also was only being partly used for cement and other hydraulic bonding agents while about 17 percent was being placed on the waste pile. The blast furnace slag balance of a large German steel works from 1928 to 1944 is shown in Fig. 10. This shows that here also only a very limited part of the slag produced was processed to slag sand; by far the greater part was used as lump slag or wasted. It is therefore necessary to explore further commercial applications for blast furnace slag, and particularly to employ the hydraulic-valuable slags to the correct applications; i.e., to em-

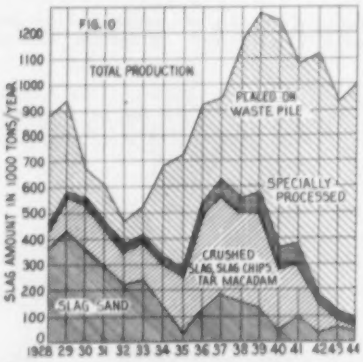


FIG.10
TOTAL PRODUCTION
PLACED ON WASTE PILE
SPECIALLY PROCESSED
CRUSHED SLAG, SLAG CHIPS TAR MACADAM
SLAG SAND
SLAG AMOUNT IN 1000 TONS/YEAR
1928 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44

Fig. 10: Representative statistics for slag. Production and uses at a large German steel works (August Thyssen Huette)

ploy them more for the production of cement and other hydraulic bonding agents.

Substitution of Cement Clinker for Slag

Rapidly cooled, basic blast furnace slag can replace the portland cement clinker to a considerable extent in cement manufacture. Very large amounts of heat are necessary for the production of the cement clinker. In Fig. 11 is shown a diagrammatic survey of heat and power consumption in the production of portland cement clinker and portland cement and also the thermal consumption with the drying and grinding of the slag to cement.

This diagram shows that in the processing of slag to cement, scarcely a quarter of the heat is required which is necessary for the production of portland cement (G. Mussgnug: Zement-Kalk-Gips, vol. I, pp. 21-30).

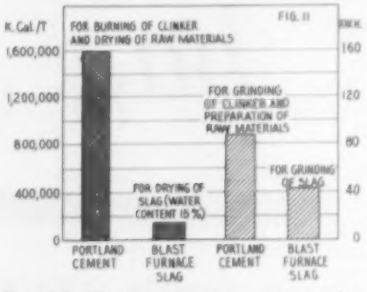


Fig. 11: Heat and power consumption figures for portland cement and blast furnace slag in processing to cement

These figures characterize particularly the economic advantages of blast furnace slag in cement production. The use of blast furnace slag in the cement industry is primarily a question of cost. The hydraulic value and the physical characteristics (condition, millability) are of chemico-technical significance. The cement industry requires a good hydraulic, easy to medium difficult millable slag with the lowest possible water content. The cement-making slags are characterized by standard basicity which has been postulated by F. Keil (Zement, vol. 31, p. 208); according to this the

$$\text{Degree of Basicity} = \frac{CaO + \frac{1}{2}S + \frac{1}{2}MgO + Al_2O_3}{SiO_2 + MnO}$$

or

$$\frac{CaO + CaS + \frac{1}{2}MgO + Al_2O_3}{SiO_2 + MnO}$$

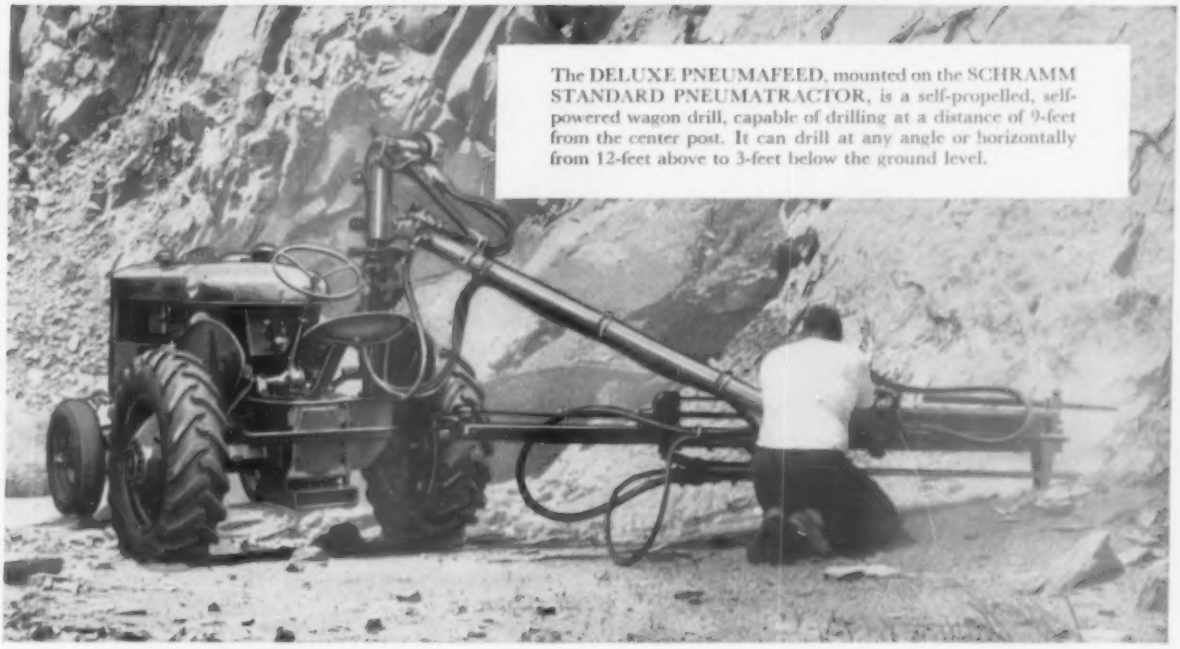
With the vitreous cooled slags, this gives a comprehensive insight into the hydraulic value. On the basis of the chemical composition, the blast furnace slags can be classified into three groups, as proposed by F. Keil (Zement, vol. 33, pp. 90-93). They are:

Group 1. Highly hydraulic

Basicity degree: above 1.7

(Continued on page 80)

*Saxonhurst, North Bank, Hassocks, Sussex, England.



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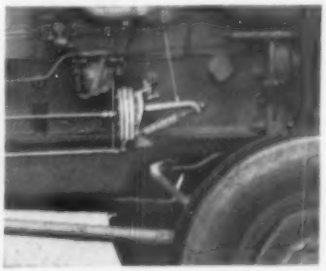

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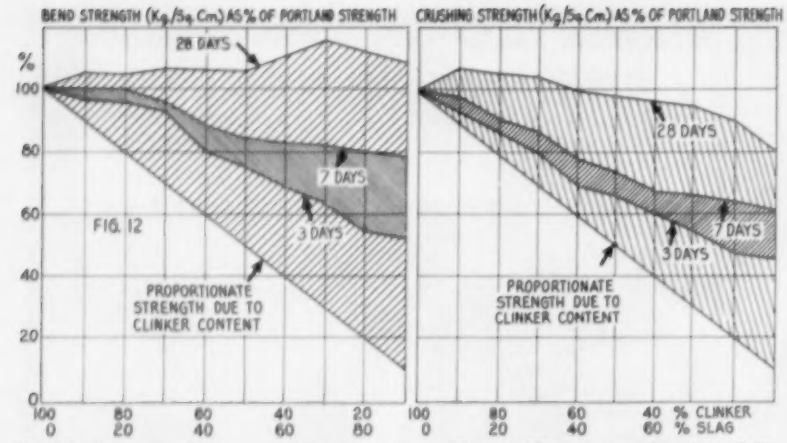

BEND STRENGTH (Kg/Sq Cm) AS % OF PORTLAND STRENGTH
CRUSHING STRENGTH (Kg/Sq Cm) AS % OF PORTLAND STRENGTH
28 DAYS
7 DAYS
3 DAYS
FIG. 12
PROPORTIONATE STRENGTH DUE TO CLINKER CONTENT
% CLINKER
% SLAG

Fig. 12: Strengths of cements with various slag additions. (Slag degree of basicity 1.7)

Group 2. Medium hydraulic
Basicity degree: 1.4 to 1.7
Group 3. Weakly hydraulic
Basicity degree: Below 1.4

The classification of blast furnace slags according to the degree of basicity is, for the present discussion, somewhat arbitrary because with the development of the characteristics, in addition to the chemistry and chemical composition, the pre-treatment of the slags (melting temperature, velocity of cooling) also plays an extremely important role (F. Koeber and W. Oelsen: Stahl und Eisen, vol. 60 pp. 921-929 and 948-55). For the exact determination of the hydraulic value of a cement producing slag, strength tests should be conducted with the portland cement clinker. Only on the basis of the strength values ascertained in this manner can the hydraulic value: i.e., a criterion for the hardening capacity, be ascertained closely.

An example for determining the hydraulic value of a blast furnace slag is shown in Fig. 12. Various mixtures of portland cement clinker and slag were prepared from a highly basic hydraulic slag (basicity degree>1.7) according to the specifications outlined by G. Haegermann (Zement, vol. 33, p. 89 and 93-97) and F. Keil (Zement, vol. 33, pp. 90-93) and tested for their strength characteristics. The strength figures ascertained are designated as percentage values of the portland cement value. The straight lines in the two systems show the strength of the clinker fraction present: i.e., the strength which would be obtained with the various mixtures if the addition material in the mixture behaved completely inertly in the hardening process. The shaded areas designate any particular strength increases with the various slag sand additions as compared with a completely inert material; for example, quartz sand.

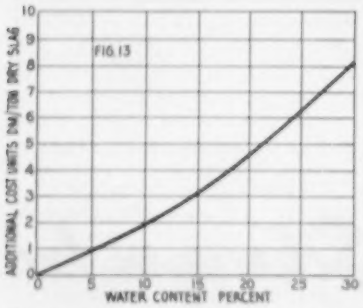


Fig. 13: Additional costs for freight and drying with dispatch of wet slag

From the diagram it follows, that the 28-day strength with various clinker-slag sand mixtures is located above the neat clinker strength, and that even with slag additions up to 90 percent to the portland cement clinker, after 28 days the cement mixture attains a considerable strength.

From the strength values ascertained, the hydraulic value (H_v) of the slag can be easily ascertained numerically by a simple formula (F. Keil: Die Hochofenschlacke, Stahleisenbuecher vol. 7 (1949) p. 78):

$$H_v = \frac{K_D - K_o}{\frac{K_k}{p}} \cdot 100 \text{ percent}$$

of which:

K_D = ascertained crushing strength of the clinker-slag mixture

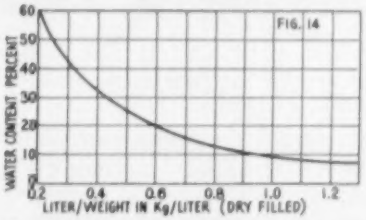


Fig. 14: Relation between water content and liter weight of water granulated slag

K_o = theoretical clinker crushing strength at (100 percent) clinker content

K_k = ascertained crushing strength with pure clinker

p = portion of blast furnace slag (percent).

In the present example, a hydraulic or a characteristic value for the hardening capacity of the slag with the preparation of iron portland cement is found. For example, after three days it is 32, after seven days it is 56, and after 28 days it is 113.

Besides the hydraulic value, in the cement industry the water content of the slag plays a decisive role. The drying not only increases the required heat consumption and therefore the production costs, but is also increases considerably the freight handling charges for one ton of dry slag. The heat consumption for the drying of slag with various water contents already has been given in Fig. 5. With increasing water content the actual drying costs increases almost linear. The dotted lines in the diagram characterize the heat consumption and the costs for the drying of the slag with a water content of 5 and 20 percent. The calculation is based on a heat of evaporation of 1000 k.cal./kg. water (theoretical 638 k.cal). This practical value can be well attained with the present state of drying techniques and suitable equipment.

With a water content of 30 percent for one ton of dry slag, it is necessary to deliver 1430 kg. of wet slag. The additional costs for the freight and the drying are shown in Fig. 13 with varying water content of the slag. It can be seen from the diagram that the price is appreciably influenced by the water content.

According to Weise, the water content falls with increasing liter/weight of the slag, (Fig. 14).

Milling Properties

An important characteristic of the slag from the aspect of cement manu-

(Continued on page 98)

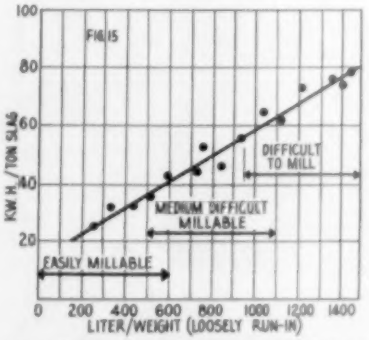
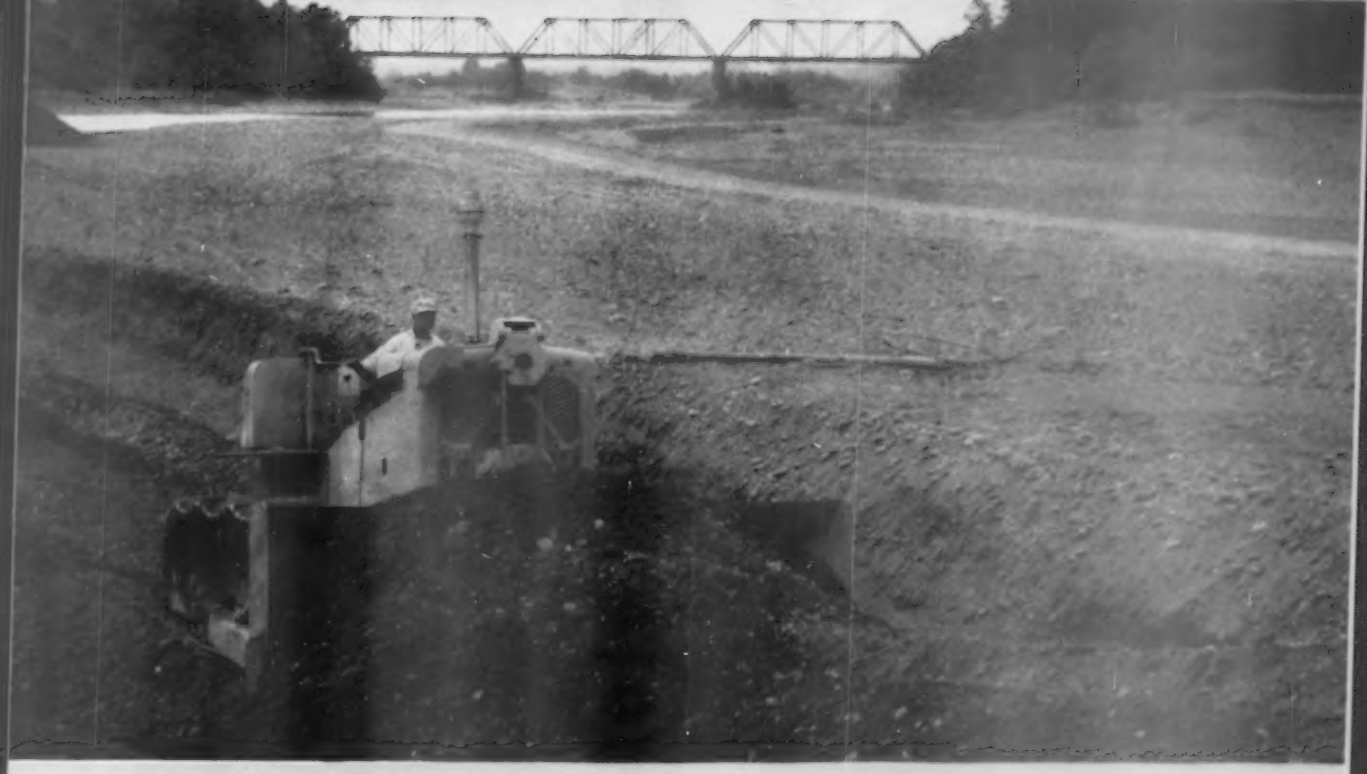


Fig. 15: Power consumption in kw.h./ton slag in milling cement slags



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Foremen of all operating departments at Thornton quarry hold half-hour safety meetings every morning. Plant superintendent Edward Schwartz is fourth from right at desk

• Material Service Corporation has set up a system of safety inspection, foremen committee, and employe meetings which have combined to achieve an outstanding safety record

By PHIL HIRSCH

How An Award-Winning Safety Program Works

DAILY PLANT-WIDE SAFETY INSPECTIONS combined with careful preplanning of all operations to eliminate potential accidents are keys to the amazingly low accident record of one of the largest commercial crushed stone quarries, the Material Service Corp. plant at Thornton, Ill.

A few months ago, the Thornton quarries, competing with 234 other quarries, received the coveted "Sentinel of Safety" award of the U. S. Bureau of Mines. Thornton went through calendar 1954, (457,570 manhours) without one lost-time injury.

Heart of the safety program at the Thornton quarry is a committee composed of foremen from each of the 12 operating departments. One member is selected by plant superintendent, Edward Schwartz, every month to act as chairman.

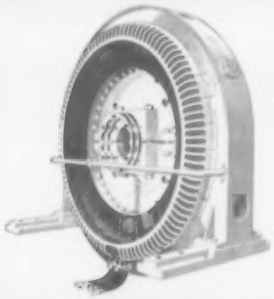
Besides presiding at meetings, the chairman spends approximately an hour each day making a safety check of all quarrying operations. The chairman has authority, if necessary, to stop any operation he considers dangerous, regardless of cost, in carrying out the safety program.

Several potential trouble spots have been cleared up because of this inspection program. Recently, for example, a new 54 in. primary crusher plant was installed. A few days afterward, the safety committee chairman noticed that an exposed 440-volt line ran close to a walkway used by the plant's overhead crane operator in entering and leaving his cab. The problem was brought to the attention of the electrical department; the exposed wire was relocated, and a protective wooden shield was installed.

(Continued on page 86)

Wooden shield was installed, and a high voltage line was relocated (arrow) to protect operator of overhead crane

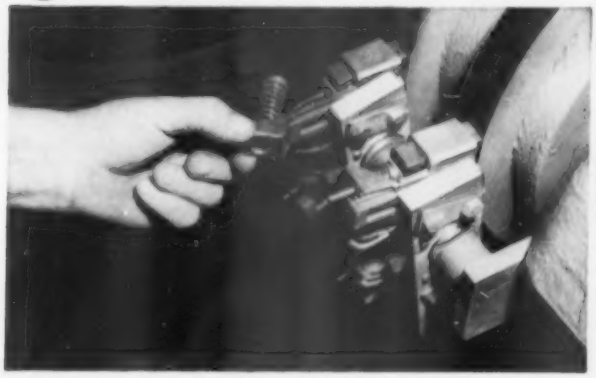
Guard rails were installed along this 48-in. belt conveyor to protect workers using the drivehouse walkway



HOW G-E SYNCHRONOUS MOTORS REDUCE MAINTENANCE COSTS

10 seconds. To start changeover, unscrew lead, release lock.

15 seconds. Slide lock back.



25 seconds. Swing locking device to one side. Remove old brush.

Install new. Changeover made in less than 60 seconds.

One-minute Brush Changeover!

As experienced motor maintenance men know, replacing worn brushes can be time consuming and costly. Not so on General Electric low-speed synchronous motors!

G.E.'s calibrated spring-loaded brush holder makes brush removal so easy it can even be done with one hand if necessary. You just unscrew the lead, release the spring lock, remove the worn brush and slide in the new. The whole operation takes less than 60 seconds per brush!

In addition, the brush holder's calibrated pin gives a clear indication of brush wear. Simply by slipping the lock down the holder you can maintain proper pressure and obtain optimum brush performance.

If you want a motor that is easy to inspect, call your nearest G-E Apparatus Sales Office. A sales engineer will gladly explain the many other advantages of G-E low-speed synchronous motors. General Electric Co., Schenectady 5, N. Y. 770-37

Progress Is Our Most Important Product

GENERAL ELECTRIC

Biggest tractor news in years...

Unequalled Power...Smoother Operation...

Here's a completely new concept of crawler tractor design and performance . . . the new TC-12 Twin-Power Euclid. It's designed and built to give you all the features you want in a tractor—more power, easy operation, greater workability and accessibility for servicing . . . and all of the power train components are matched, with years of application in earth moving equipment.

Powered by two diesels with separate Torqmatic Drives for each track, the TC-12 has 365 h.p. available for tractive effort — a smooth steady flow of power to meet any job requirement. There's no master clutch and no manual gear shifting . . . the operator simply moves a lever to select one of three speed ranges — forward and reverse — for travel speeds up to 8.3 m.p.h. Maximum drawbar pull is equal to, or greater than, the weight of the tractor and any attachments.

Each half of the tractor is separate and free to oscillate on a single transverse shaft. This gives the TC-12 maximum stability and traction on rough ground. The tractor can be easily separated into two halves for shipment when necessary.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Never before so much WORKABILITY!

the "Euc" TC-12 Twin Crawler

INDEPENDENT TRACK DRIVES

"Hair trigger" control of steering at all times and in any speed range, forward or reverse, is a result of each track having a separate power train. Spin turns, fast and tight, can be made by reversing one track and keeping the other in forward speed. Routine steering is done easily by putting one transmission lever into neutral and using the track brake. Fast, easy steering is one of the outstanding design and performance features of the "Euc" TC-12.

TWIN ENGINES

With 365 h.p. delivered to the power train, the TC-12 has far more horsepower than any other "big" tractor . . . and the weight to use this power as tractive effort. It develops greater drawbar pull at faster travel speeds . . . a mighty important feature for work with rubber tired scrapers and other crawler applications. A top travel speed of 8.3 m.p.h. and faster speeds in the working ranges give the TC-12 a big advantage in workability.

EASE OF OPERATION

The power train of the TC-12 provides simple operation and a smooth flow of power. There is no master clutch . . . shifting from one of the three speed ranges to another is done under full power with no loss of momentum. There's no delay for stopping or clutching. Independent track drives gives this "Euc" fast, easy steering under all job conditions.

TORQMATIC DRIVES

Each track is driven by a GM 6-71 diesel through a separate Allison Torqmatic converter and transmission. Shifting from one of the three speed ranges to another can be done under full power with no loss of motion . . . the tractor can be shifted into reverse while moving forward so there's no lost time for stopping and clutching. The power train of the TC-12 provides a steady flow of power that's matched to other equipment and job requirements.

More Workability

RADIATORS AT REAR

Rear location of the cooling system maintains efficient engine operating temperatures and provides better front visibility for the operator. Hinged radiator hoods make it a simple matter to change a fan belt or to service the radiator.

ACCESSIBILITY

Unitized assemblies are all easy to get at—they can be removed or serviced without tearing down other parts. Accessibility of all major components that can't be equalled in any other crawler—keeps downtime to a minimum. All lubrication fittings and check points are located for easy servicing—fuel tanks have ample capacity for full shift operation.

SPECIFICATIONS

total h.p.—388 h.p. at rated speed
available for tractive effort—365 h.p.
speeds—3 speed ranges forward and reverse to 8.3 mph
drawbar pull (bare tractor)—forward and reverse—
54,000 lbs. low range
53,500 lbs. intermediate
53,000 lbs. high range

track width (standard shoe)	26"	track gauge	110"
overall width	11' 4"	overall length	16' 2"
height (excluding stacks)	7' 11"	drawbar height	23"
ground clearance	20"	operating weight (bare)	approx. 58,000 lbs.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

Investigation of a near-accident resulted in this modification in caps used on ready-mixed concrete truck water tanks. Cap at left will fly off tank at high speed when loosened if air release valve is not opened first. Cap at right has holes above thread which provide automatically for air release

SAFETY WINNER

(Continued from page 82)

Not long afterward, a hazard along a 48-in. belt conveyor, carrying minus 6-in. stone from the primary crusher to a mill containing secondary crushing equipment was cleared up. At one point in the drivehouse, the conveyor ran about 8 in. above the floor at a speed of 500 f.p.m. Conceivably a workman could fall onto the belt and be injured. The hazard was removed after a safety committee chairman suggested that guard rails be installed on each side of the conveyor in the affected area.

Every morning, the safety committee meets for half an hour to discuss the day's operations. Suggestions are made aimed at producing maximum safety, as well as maximum efficiency, on the job. Once a month, the group holds a longer meeting, at which an intensive study is made of the overall safety program with a view toward improving it; problems that have arisen are discussed and recommendations made for their correction.

The reason so much safety responsibility is put into the hands of foremen was summed up by plant superintendent Schwartz: "With a plant as large as ours," he explained, "It's impossible for top management to keep its eyes on every detail of every job. The foreman, because he's so much closer to the day-to-day operations, is able to spot seemingly minor hazards that could easily develop into major ones if left alone. Besides, from experience, the foreman usually knows what's needed to remove the danger. Thus, we feel he is the best man to handle safety maintenance."

Here are a few of the changes that have come about as a resut of the daily and monthly committee meetings:

Recently, a new 1000 cu. yd. per day ready-mixed concrete plant was installed at the quarry. The plant includes four storage bins, each approximately 150 ft. high. The old plant, with an output about half as large, had 40-ft. bins.

When night time cement deliveries were expected, it had been the practice to station one workman at the controls of the screw conveyor equipment that carried the cement up and into the old silos. However, when the new plant went into operation, one foreman suggested that, because of the increased height, two men be put on the job, in case one of them had an accident. "It was a seemingly minor change, perhaps," plant superintendent Schwartz explained, "yet one which might save a life one day."

Last summer, the dinky engines and hopper cars used to bring stone from the quarry face to the crushers were replaced by Euclid Model 46TD trucks. Thanks largely to recommendations made by foremen at the meetings, several minor safety hazards created by the switch were removed.

For example, it was found that loaded trucks were traveling at speeds which caused an excessive strain on their tires, so speeds were reduced. The route to and from the crushers passes through a 90-ft. tunnel; one foreman suggested that traffic lights be installed at each end of the tunnel instead of using a flagman, since this change, by eliminating the human factor, would appreciably reduce the chance of accident. While this article was being written, plans for the lighting system were being drawn by the Material Service engineering department, in collaboration with company safety officials.

Besides uncovering these and other hazards, the meetings have a second benefit at least as important. Many of the quarry's operations, particularly maintenance jobs, require that several departments cooperate. For example, when crusher plant screens have to be repaired or replaced, the services of welders, electricians, mechanics, and the mill gang are normally required. Three foremen would share the supervision of such a job.

The daily meetings enable foremen to schedule the sequence of operations so that the whole job can be completed with maximum efficiency and safety. If each foreman planned his part of the job alone, Thornton officials explained, the crews could easily get in each other's way, with a resultant increase in the accident hazard.

Monthly Employe Meetings

Once a month, besides the safety committee meetings, there are sessions in each department attended by all workers. An important part of these gatherings is a general discussion period at which hourly-rated employes are asked for suggestions. Several valuable ideas have been produced. Here's one:

Cylinders of oxygen and acetylene gas were formerly stored in a wooden shack located about 75 ft. from the machine shop. The cylinders, weighing anywhere from 80 to 100 lb., had to be carted by two men across this space whenever the gas was needed in the shop. Lifting the cylinders created one potential hazard. And, in winter, with snow and ice on the ground, there was danger that the men woud slip.

A machine shop employe suggested that both hazards could be eliminated by using hand trucks and building an addition to the machine shop for gas storage. His idea is now being put into effect. The storage facility is being built of concrete block to reduce the fire hazard.

Employe Cooperation

Another key reason for Thornton's unusually good safety record is that regulations concerning safety apparel are scrupulously obeyed. Material Service has solved a problem many other firms face — lack of cooperation on the part of employes — by use of these measures:

1. Everyone — including all management officials and all visitors — is required to wear appropriate safety equipment in areas where it is specified for workers.

2. Virtually all of the equipment — even safety glasses — is available at no cost to the employes. The only exception is safety shoes, cost of which is shared between the company and the worker. However, Material Service obtains these shoes at a wholesale price, approximately 40 percent under the amount a retail store would charge, and passes this saving on to the worker. Also, workers are allowed to pay their share in installments, which may be deducted from their paychecks.

3. Several "horrible examples" of

(Continued on page 98)

B.F.Goodrich

All-Nylon Universal tires eliminate impact breaks for rock company

LONG ROCK COMPANY of Princeville, Illinois, has hauled thousands of tons of stone in the past few years from quarry to crusher to road-construction site. Trucks must travel over rock and rough roads—conditions that used to rip and tear tires and run up costs.

Then Long Rock switched to new B. F. Goodrich *all-nylon* Universal tires. "These tires," writes James Long, "have eliminated impact breaks and do a fine job of resisting cuts and abrasions. Our switch to your *all-nylon* Universal tires has saved us down-time and hundreds of dollars annually."

B. F. Goodrich Universal tires give such outstanding service because the tread is specially compounded to resist rock cuts. The *all-nylon* cord body withstands double the impact of ordinary materials, resists heat blowouts and flex breaks. No wonder the *all-nylon* body outwears even the extra-thick tread, *can still be recapped over and over!*

See your B. F. Goodrich retailer today and find out how you can get longer service at lower cost with B. F. Goodrich *all-nylon* Universal tires. Or write *The B. F. Goodrich Co., Tire & Equipment Div., Akron 18, Ohio.*

"WE WOULDN'T USE any tires in our operations that were not of B. F. Goodrich *all-nylon* construction," writes James Long.

UNITS of County Concrete, Inc., Newtown, Ohio, roll on such tires as the BFG *all-nylon* All-Purpose. All replacements are BFG.

Specify B. F. Goodrich tires when ordering new equipment

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

Your B. F. Goodrich retailer is listed under Tires in the Yellow Pages of your phone book

Insulating FIREBRICK for Exposed Lining In Rotary Cement Kilns

SECOND ARTICLE OF SERIES

. . . discusses the question, "How long should the lining be and what should be its position in relation to the discharge end and feed end of kiln, and what should the thickness be?"

By LEOPOLD TSCHIRKY*

INSULATING FIREBRICK should not be installed nearer to the discharge end of the kiln than a location where temperature at the hot face of the lining will be so high as to cause fusion of the brick when in the presence of the load material passing over it. As was shown earlier that would be at a point where the hot face of the lining will not exceed about 2200 deg. F. In a normally operating rotary cement kiln that is a point not far removed from the feed end of the sintering or burning zone.

This is borne out by the data contained in the excellent article "The Thermal Efficiency of the Portland Cement Kiln" by Hans Gygi of Zurich, Switzerland, that appeared in the British trade journal *Cement and Lime Manufacture* from November 1937 to July 1938 and still considered by many to be the most thorough and elaborate kiln investigation that has been published. Hans Gygi's experiments and calculations were in connection with a wet process kiln, the general outline of which is shown at the bottom of Fig. 6. The kiln had a slope of approximately ⅜-in. per ft. of length, was charged with slurry feed containing 34 percent H_2O which was burned to a temperature of 2552 deg. F. Coal of 13,760 B.t.u. calorific value was used for fuel and consumed at the rate of 67.16 lb. per bbl. The speed of the kiln was one revolution every 78 sec. and clinker was discharged at the rate of 1231 bbl. (376 lb. each) of finished cement per day. In the upper portion of Fig. 6 are curves plotted by Hans Gygi to show calculated gas temperatures, actual determinations of wall (hot face of lining) temperatures and material (load) temperatures throughout the entire length of kiln. Note that the location where wall temperature reached a maximum of 2200 deg. F. is at a point about 70 ft. from the discharge end of the kiln or almost at the feed end of the burning zone. If in this kiln one could be certain that the temperature of the hot face of the lining would never exceed 2200 deg. F. nearer to the discharge end than is shown by the curve of maximum wall temperatures, the insulating firebrick lining could start 70 ft. from the discharge end and extend throughout the entire preheating zone. That would be a length of approximately 95 ft. or 42 percent of the kiln's total length. In a corresponding dry process kiln, the insulating

*General Refractories Co., Philadelphia, Penn.

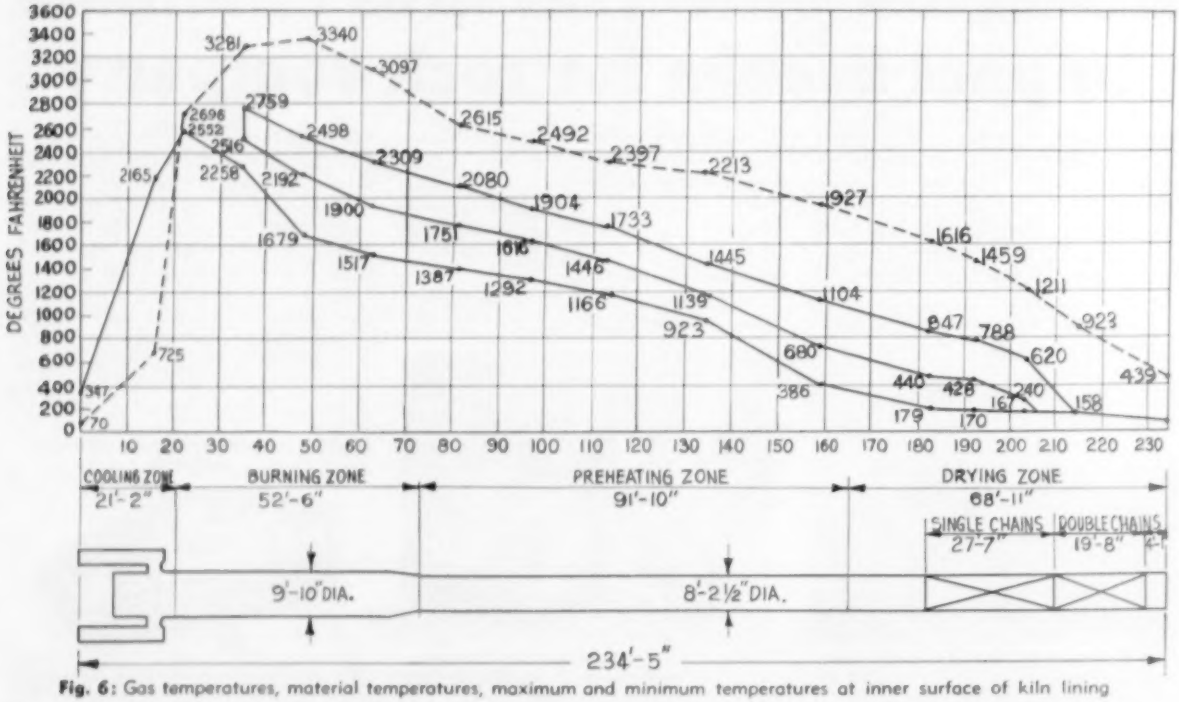


Fig. 6: Gas temperatures, material temperatures, maximum and minimum temperatures at inner surface of kiln lining

HOW'S THIS FOR PROFITABLE AGGREGATE PRODUCTION?

- Output per 10-hour day—
  200 T. of-⅛"; 300 T. of-½";
  500 T. of-1"; 400 T. of-1¼";
  600 T. of-1⅞"; 400 T. of-3".
- Total daily production — 2400 Tons
- Material — Quarry-run limestone
- Silica content—Approximately 16%

"Our CEDARAPIDS DOUBLE IMPELLER IMPACT BREAKER is doing a real job"

Says **Edgar N. Putman, Supt.**
NEW HOPE CRUSHED STONE & LIME CO.
New Hope, Pa.

Take it from this quarry operator —producing six sizes of specification material at a steady 240 ton per hour clip is profitable production! "With our 4350H Impact Breaker we're getting good breakage, ample crushing capacity, and operating costs are low," says Edgar Putman.

In addition to the Cedarapids Double Impeller Impact Breaker, the New Hope plant includes a 40"x12' heavy-duty cast steel Apron Feeder and three Horizontal Vibrating Screens — all Cedarapids!

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA ·

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

AMERICAN ROAD BUILDERS ASSOCIATION

WHAT'S YOUR PRODUCTION PROBLEM?

If you need output of 240 tons per hour, 40 tons per hour, or 800 tons per hour — of finished product ranging from aglime to riprap — there's a Cedarapids portable or stationary aggregate plant built to produce the tonnage you want at the low cost that means extra profit. If you produce bituminous concrete, check the complete line of Cedarapids batch-type and continuous-flow type plants.

Cedarapids — Built by IOWA

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

KIND OF LINING MATERIAL	LINING THICKNESS	SHAPE OF BRICK USED	10'-0" DIAMETER KILN SHELL		11'-3" DIAMETER KILN SHELL	
			COST PER 1 FT OF LINING LENGTH DELIVERED TO DESTINATION A	COST PER 1 FT OF LINING LENGTH DELIVERED TO DESTINATION B	COST PER 1 FT OF LINING LENGTH DELIVERED TO DESTINATION A	COST PER 1 FT OF LINING LENGTH DELIVERED TO DESTINATION B
INSULATING FIREBRICK	4½"	9" x 4½" x 3" ARCH BRICK	$ 54.67	$ 50.14	$ 61.00	$ 62.20
INSULATING FIREBRICK	6"	9" x 6" x 3" ARCH BRICK	$ 112.46	$ 113.18	$ 126.92	$ 127.50
INSULATING FIREBRICK	6¾"	9" x 6¾" x 3" ARCH BRICK	$ 112.91	$ 113.60	$ 127.34	$ 128.12
INSULATING FIREBRICK	9"	9" x 4½" x 3" WEDGE BRICK	$ 106.97	$ 107.80	$ 120.63	$ 121.56
FIRECLAY BRICK	6"	9" x 6" x 4" ROTARY KILN BLOCK	$ 68.92	$ 68.76	$ 80.92	$ 80.74
FIRECLAY BRICK	9"	9" x 9" x 4" ROTARY KILN BLOCK	$ 73.21	$ 72.91	$ 83.04	$ 83.49

Fig. 7: Comparison of delivered cost per one foot of kiln lining length based on price presently effective for shipment in full carload lots of 60,000 lb. In all cases the cost figures include the required bonding material

firebrick lining could be extended to within a few feet of the charging spout and in so doing materially increase the percentage of kiln length so lined.

The prudent thing to do is to deal with insulating firebrick linings in the same manner that one does — or should — deal with conventional fireclay brick linings and that is to provide a reasonable factor of safety when fixing on the location where it is expected that hot face lining temperature will not exceed 2200 deg. F. In dry process kilns the insulating firebrick lining can extend to within a few feet of the charging or feed spout. In wet process kilns the insulating firebrick lining should not extend beyond the point where all free moisture has been driven from the feed material. It should never be laid within a chain system and a good safety precaution is to stop the insulating firebrick lining about 20 feet or so from the discharge end of the chain system.

How Thick Should Lining Be?

The choice of thickness of insulating firebrick lining is a matter that involves a number of considerations. A few of the items to be considered are relative first cost, relative weight, effect of different thicknesses of lining on effective cross sectional area, as well as on exposed surface area, and, of course, the keying-in effect of one thickness of lining versus another when the lining is being considered for kiln shells of relatively large diameter.

Any first cost figures given at this time are simply for illustrative purposes and must be accepted as subject to revision should there be any change in presently effective base prices. Furthermore, cost comparisons will differ somewhat depending upon destination. However, in order to give some general idea of relative values, present costs have been calculated for different thickness of lining for kiln shells of 10-ft. diameter and 11-ft. 3-in. diameter based on delivery in 60,000-lb carload lots to two widely separated cement producing districts. These will be found in the tabulation shown in Fig. 7 where "Destination A" is an eastern cement producing district and "Destination B" a mid-western cement producing district.

The matter of relative first costs and how they affect the choice of lining thickness is really a secondary consideration and needs no further elaboration. Comparisons of lining weights, effective cross sectional areas and exposed surface areas for different thicknesses of lining will be found in the tabulations that appear in Fig. 8.

The manner in which relative weights, effective cross sectional areas and exposed surface areas can and do influence the choice of lining thickness are a prime consideration. The extent to which they influence choice of lining thickness will be covered in considerable detail in the answer to the question "What Are The Advantages?," which will follow later.

Obviously, and aside from any other considerations, one should choose a lining that has sufficient thickness to be assured ample keying-in effect to satisfactorily hold the lining in place. In that respect a 4½-in. thick lining should afford ample thickness, even for kilns of diameter as large as 12 ft. That this is so is proven by the fact that we know of 4½-in. thick linings of hard-wear resisting brick serving satisfactorily in the chain systems of

(Continued on page 93)

COMPARISON OF APPROXIMATE WEIGHTS PER ONE (1) FOOT OF KILN LINING LENGTH

KIND OF LINING MATERIAL	LINING THICKNESS	DIAMETER OF KILN SHELL						
		8'-0"	9'-0"	10'-0"	10'-6"	11'-0"	11'-3"	12'-0"
INSULATING FIREBRICK	4½"	490 LBS	552 LBS	620 LBS	650 LBS	685 LBS	700 LBS	744 LBS
INSULATING FIREBRICK	6"	636 LBS	715 LBS	801 LBS	841 LBS	890 LBS	905 LBS	967 LBS
INSULATING FIREBRICK	6¾"	704 LBS	797 LBS	892 LBS	935 LBS	991 LBS	1013 LBS	1082 LBS
INSULATING FIREBRICK	9"	910 LBS	1027 LBS	1156 LBS	1210 LBS	1285 LBS	1313 LBS	1396 LBS
FIRECLAY BRICK	6"	1561 LBS	1753 LBS	1957 LBS	2050 LBS	2154 LBS	2248 LBS	2388 LBS
FIRECLAY BRICK	9"	2263 LBS	2558 LBS	2853 LBS	2999 LBS	3146 LBS	3294 LBS	3512 LBS

COMPARISON OF EFFECTIVE CROSS-SECTIONAL AREAS

KIND OF LINING MATERIAL	LINING THICKNESS	DIAMETER OF KILN SHELL						
		8'-0"	9'-0"	10'-0"	10'-6"	11'-0"	11'-3"	12'-0"
INSULATING FIREBRICK	4½"	41.28 SQ.FT.	53.46 SQ.FT.	67.20 SQ.FT.	74.66 SQ.FT.	82.51 SQ.FT.	86.59 SQ.FT.	99.40 SQ.FT.
INSULATING FIREBRICK	6"	38.48 SQ.FT.	50.26 SQ.FT.	63.61 SQ.FT.	70.88 SQ.FT.	78.54 SQ.FT.	82.51 SQ.FT.	95.03 SQ.FT.
INSULATING FIREBRICK	6¾"	37.12 SQ.FT.	48.70 SQ.FT.	61.86 SQ.FT.	69.02 SQ.FT.	76.59 SQ.FT.	80.51 SQ.FT.	92.88 SQ.FT.
INSULATING FIREBRICK	9"	33.18 SQ.FT.	44.18 SQ.FT.	56.74 SQ.FT.	63.61 SQ.FT.	70.88 SQ.FT.	74.66 SQ.FT.	86.59 SQ.FT.
FIRECLAY BRICK	6"	38.48 SQ.FT.	50.26 SQ.FT.	63.61 SQ.FT.	70.88 SQ.FT.	78.54 SQ.FT.	82.51 SQ.FT.	95.03 SQ.FT.
FIRECLAY BRICK	9"	33.18 SQ.FT.	44.18 SQ.FT.	56.74 SQ.FT.	63.61 SQ.FT.	70.88 SQ.FT.	74.66 SQ.FT.	86.59 SQ.FT.

COMPARISON OF EXPOSED SURFACE AREA PER ONE (1) FOOT OF KILN LINING LENGTH

KIND OF LINING MATERIAL	LINING THICKNESS	DIAMETER OF KILN SHELL						
		8'-0"	9'-0"	10'-0"	10'-6"	11'-0"	11'-3"	12'-0"
INSULATING FIREBRICK	4½"	22.78 SQ.FT.	25.92 SQ.FT.	29.06 SQ.FT.	30.63 SQ.FT.	32.20 SQ.FT.	32.98 SQ.FT.	35.34 SQ.FT.
INSULATING FIREBRICK	6"	21.99 SQ.FT.	25.13 SQ.FT.	28.27 SQ.FT.	29.84 SQ.FT.	31.41 SQ.FT.	32.20 SQ.FT.	34.56 SQ.FT.
INSULATING FIREBRICK	6¾"	21.60 SQ.FT.	24.74 SQ.FT.	27.88 SQ.FT.	29.45 SQ.FT.	31.02 SQ.FT.	31.81 SQ.FT.	34.16 SQ.FT.
INSULATING FIREBRICK	9"	20.42 SQ.FT.	23.56 SQ.FT.	26.70 SQ.FT.	28.27 SQ.FT.	29.84 SQ.FT.	30.63 SQ.FT.	32.99 SQ.FT.
FIRECLAY BRICK	6"	21.99 SQ.FT.	25.13 SQ.FT.	28.27 SQ.FT.	29.84 SQ.FT.	31.41 SQ.FT.	32.20 SQ.FT.	34.56 SQ.FT.
FIRECLAY BRICK	9"	20.42 SQ.FT.	23.56 SQ.FT.	26.70 SQ.FT.	28.27 SQ.FT.	29.84 SQ.FT.	30.63 SQ.FT.	32.99 SQ.FT.

Fig. 8: Comparative data on weights, effective cross-sectional areas and exposed surface area

when it comes to...

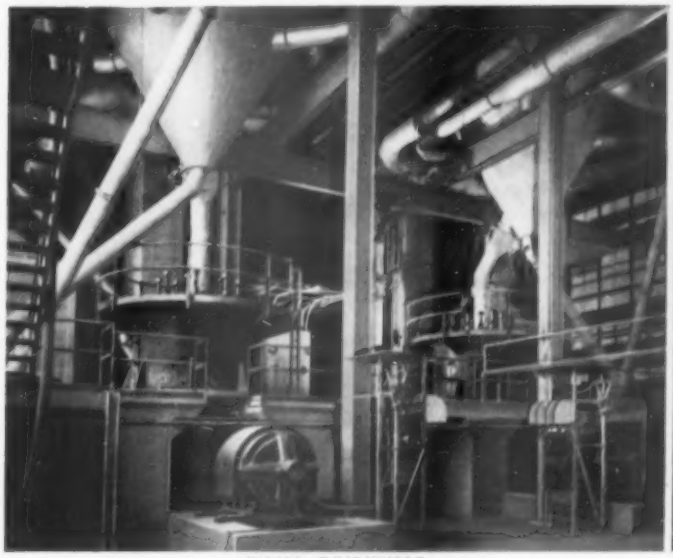
RAW GRINDING • CLINKER GRINDING

You Need All 3

1 MAXIMUM CAPACITY

2 HIGH QUALITY PRODUCT

3 ECONOMY



RAW GRINDING

CLINKER GRINDING

The B&W Closed-Circuit Raw Grinding System—also with an outstanding record of service—eliminates the need for separate drying equipment. Cement rock, limestone, shale and other raw materials are ground and dried simultaneously within the System. Its Type EL Pulverizer—also widely used for clinker grinding—delivers maximum capacity of product with low power demand. With this mill, maintenance costs are sharply reduced due to the uniform wear and long life of the tough, alloy grinding elements. Space requirements are smaller because this compact, yet powerful mill provides for higher capacity in equal space.

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C-210

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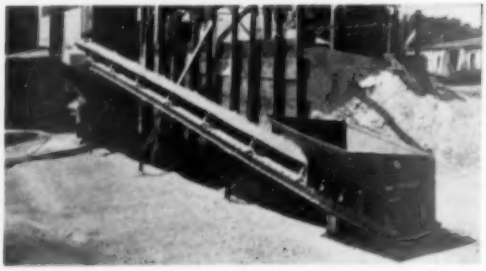
Long or short haul—it costs less to move materials with belt conveyors

Thousands of installations—ranging from a few feet to thousands of feet—prove that belt conveyors move bulk material at lowest cost.

No other machine is so simple in construction or requires so little maintenance. No other machine can deliver such high hourly capacities with so little power or attention.

Barber-Greene has given a new meaning to belt conveyor economy. Built of standardized components, Barber-Greene Conveyors are delivered sooner . . . require less engineering . . . are erected faster . . . give top performance . . . and are more easily altered to meet changing or expanding requirements. Being standardized, repair parts are readily available—usually from the stock of your local distributor.



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CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

several 12 ft. diameter kiln shells. As a matter of fact such thickness of hard wear resisting brick is being held satisfactorily in the chain system of a 13-ft. 2-in. diameter kiln shell in a plant in Canada. So if in kilns of such large diameter 4½-in. thickness of lining affords sufficient keying-in effect to satisfactorily hold in place as heavy, dense and brittle a brick lining as is used to line chain systems, there seems no reason why 4½-in. thickness should not be ample to satisfactorily key-in and hold the very much lighter weight and far more resilient insulating firebrick. Furthermore, insulating firebrick do not have the variations in workmanship that are to be expected in all grades of regular fireclay brick. Insulating firebrick are truly a tailor-made product for every brick is cut to the exact size to lay up in tight circles of the diameter for which specified. The so-called "blanks" from which the brick are cut are manufactured well over-size so that all six faces need to be cut on brick cutting saws specially equipped for the purpose. Fig. 9 illustrates not only one of the brick cutting saws but also the manner in which the brick are double checked on templets for accurate sizing after leaving the saw. With such care exercised to assure sizing to far greater accuracy than is ever possible in the manufacture of conventional fireclay brick, one can expect maximum keying-in effect when the insulating firebrick are installed in the kiln.

In the latter connection, it is of interest to mention that one prominent cement company which is already well into its second year's experience with a 4½-in. thick insulating firebrick lining in an 11-ft. 3-in. diameter dry process kiln, has recently ordered 4½-in. thick insulating firebrick lining for a new 12-ft. diameter wet process kiln.

Fig. 9: Specially equipped brick cutting saw, showing how finished brick are double-checked on templets for accurate sizing

What Are the Advantages?

It has been shown that by replacing conventional fireclay brick lining with insulating firebrick lining, one can materially reduce kiln shell temperature and heat lost through and from the kiln shell. It has also been shown that a large proportion of the saved B.t.u. are made available to do useful work within the kiln and to do so within that part of the kiln where most of the heat is absorbed by the raw material. If this produced no other result it should at least effect a reduction in fuel consumption. But no matter what reduction takes place in fuel consumption, that would be a small item compared to the benefit derived from a better conditioning of the load material before it enters the burning zone. Better conditioning of the load material before it enters the burning zone would aid decarbonation and reduce the percentage of undecarbonated load material that usually finds its way into the burning zone to act as a refrigerant, thereby reducing production and increasing fuel consumption.

In the past when linings were installed to provide greater insulating

(Continued on page 96)

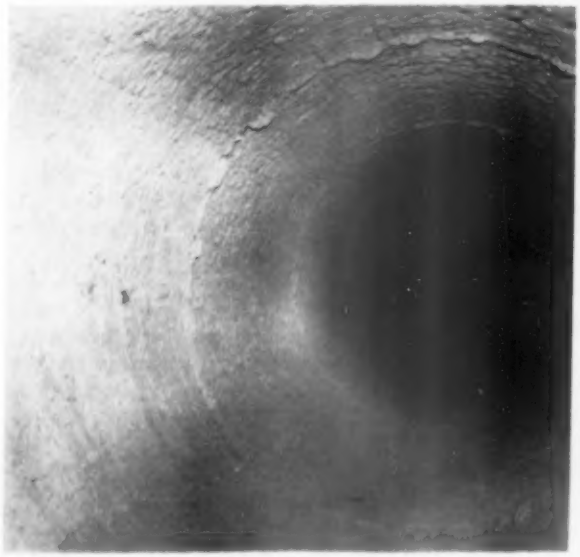
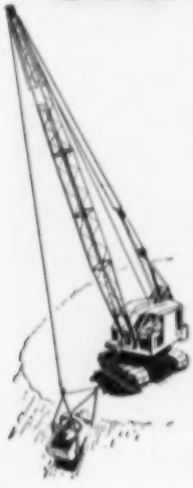


Fig. 10: View of an insulating firebrick lining with no evidence of spalling after over five years' service

Fig. 11: Close-up of same lining shown in Fig. 10 to show severely spalled condition of the adjacent fireclay brick lining

Shovel-Crane owners!

sharing your profits with old-fashioned clutches?



Remember the day the weather was fine, footing good and the haulers were really rolling...

THAT was the day you thought the job was going to move out ahead of schedule. But the clutches were getting hotter all the time. By mid-morning the dragline went down for clutch adjustment—the heat had done it. After the noon break, the same thing happened. How much production do you figure you were penalized for having a rig with old-fashioned clutches?

Avoid costly downtime

With a Link-Belt Speeder you get modern power, hydraulic-actuated clutches that automatically compensate for heat and normal lining wear. In fact, most Link-Belt Speeder owners will tell you these clutches are so good, adjustment is needed only once or twice a month.

It's just one of many ways you're big money ahead with a Link-Belt Speeder.

Get the complete story from your distributor. He'll show that whatever rigs you need—crawler or rubber-tired . . . ½ to 3-yd, 8 to 60-ton capacity—you'll earn bigger return on your equipment dollars with a Link-Belt Speeder. Or write for literature—LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA. 13,959

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First choice of men who know 6-wheel costs

Model RF-201 — gasoline-powered 6-wheeler, 39,000 lbs. GVW.

Now — *NEW* Gasoline, LPG and Diesels for a total of *101* models

SF-180 Series—GVW rating, 30,000-33,000 lbs. GCW, 45,000 pounds. Gasoline or LPG engines.

RF-200 Series—GVW, 37,000-41,000 lbs. GCW, 65,000 lbs. Royal Red Diamond 212-hp gasoline engine, optional.

RDF-210-H Series—GVW rating, 37,000-45,000 lbs. Diesel-powered. For highway or off-highway service.

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DF-400 Series—GVW rating, 40,000 lbs. GCW rating, 76,800 lbs. Diesel-powered. For highway or off-highway service.

Here are 3 BIG reasons why:

1. **World's Widest Range of 6-wheel Models.** The INTERNATIONAL 6-wheel truck line offers trucks of every size and type from 22,000 to 90,000 pounds GVW—conventional and COE, gasoline, LPG and diesel—all available in hundreds of variations for *exact* matching to the requirements of every job.

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3. **Built to Last Longer, to Cut Costs.** INTERNATIONAL 6-wheel trucks are built and tested to take the toughest heavy-duty jobs you can hand them. They're built to stay on the job to *earn* money—out of the shop to *save* on operating and maintenance costs.

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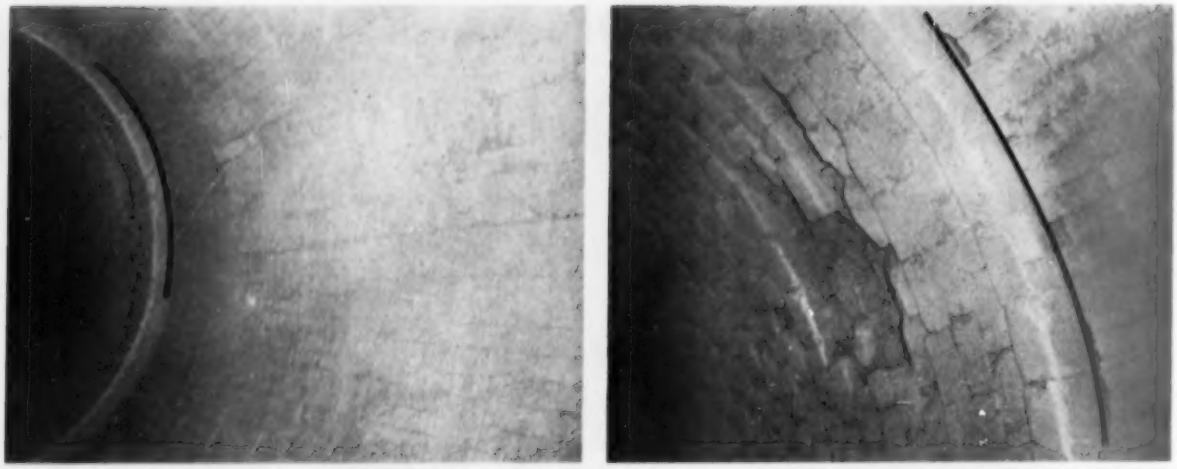


Fig. 12: Views of the interior of a cement kiln that illustrate lack of spalling, left, in the insulating firebrick lining in the foreground, and severe spalling, right, closeup, in adjacent fireclay brick lining in the background

KILN LININGS

(Continued from page 93)

effect than the conventional 6-in. thick fireclay brick lining, they have usually been either 9 in. thick fireclay brick linings or linings of 6 in. thick fireclay brick laid over a 3-in. layer of insulating material of one sort or another. It has been shown that a 4½ in. thick insulating firebrick lining provides excellent insulating effect — insulating effect considerably greater than that of a 9 in. thick fireclay brick lining and probably just as good as most combination linings of 9 in. overall thickness. Such 4½ in. thick insulating firebrick lining, when compared to the 9 in. thick linings, results in an appreciably greater effective cross sectional area. This will have the effect of correspondingly reducing the velocity of the hot gases within the zone of 4½ in. thick lining, thereby obtaining greater effectiveness of the hot gases as they pass over the load. This should also tend to reduce dusting tendency. By increasing the effective cross sectional area, the exposed surface area of the lining is also increased which is a further step in the direction of more effective heat transmission to the load material.

The substitution of insulating firebrick lining for fireclay brick lining of the same or greater thickness results in a very substantial reduction in lining weight. The weight of a 4½ in. thick insulating firebrick lining is about 21 percent that of a 9 in. thick fireclay brick lining and 31 percent that of a 6 in. thick fireclay brick lining. And when compared to what in past years has been a rather widely used combination lining of 6 in. thick fireclay brick laid over a 3 in. thickness of insulating material, the 4½ in. thick insulating firebrick lining weight is about 28 percent that of the combination lining. Such reduction in weight is significant for more reasons than simply reducing the power required to turn the kiln. It reduces materially torque and deflection in the kiln — items which, in the author's opinion, have been a major contributing cause to much of the spalling (mechanical spalling) that has occurred with fireclay brick linings in some of the relatively new long kilns and have probably also contributed to considerable extent to the loosening up and resultant failure experienced with combination linings. Not only is the insulating firebrick lining considerably lighter in weight than the combination lining of fireclay brick laid over insulating material, but it also represents lower first cost, maximum simplicity in construction and being formed of but one unit represents greater overall structural stability. And, of course, the lighter the kiln weight, the less wear to be expected on trunnion bearings.

Furthermore, insulating firebrick are more resilient and better able to withstand thermal spalling than the conventionally used fireclay brick. By referring to the physical properties mentioned earlier for insulating firebrick, high duty fireclay brick and super duty fireclay brick, it will be seen that the moduli of elasticity (1×10^{-6} lb. per sq. in.) for these brick is given as 0.295, 2.84 and 2.37, respectively. A comparison of these values is significant because modulus of elasticity is one of the important factors in thermal spalling resistance and the lower the modulus of elasticity, other thermal properties being practically constant, the greater is the resistance to thermal spalling. This better resistance to thermal spalling has been very evident in several installations and is illustrated in Figs. 10, 11 and 12.

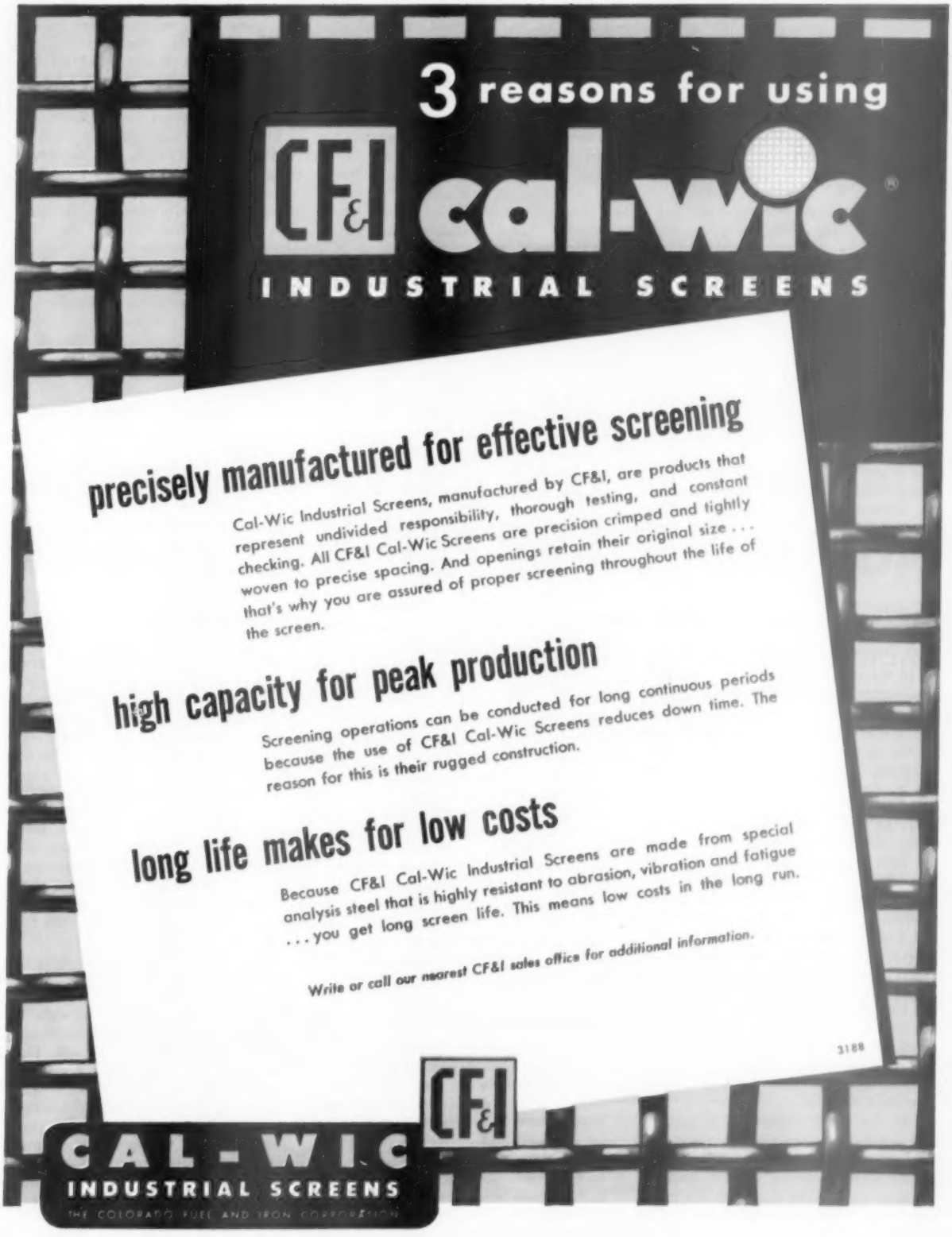
Fig. 10 is a view of an insulating firebrick lining still in excellent condition after five years service in an eastern cement plant. There is no evidence of spalling anywhere in the lining. Fig. 11 is another view of the same lining taken to show the severely spalled condition of the immediately adjacent fireclay brick lining. Fig. 12 is a view of the interior of a kiln in a far western cement plant, the lining in the foreground up to the black dividing line being insulating firebrick and the balance fireclay brick. At the time the photograph was taken the linings had been subjected to but four months' service. There is no evidence of spalling in the insulating firebrick lining whereas a badly spalled section can be seen in the fireclay brick lining.

Relative ability to resist spalling not only affects lining life, but no doubt also has some effect on dust loss for one would expect greater dusting tendencies when load material passes over a rough spalled surface than if passing over a smooth unspalled surface.

Another advantage in favor of insulating firebrick linings versus conventional fireclay brick linings is the ability to maintain greater uniformity of internal kiln conditions irrespective of changing external conditions. That can well be a major advantage in kilns unprotected from changing weather conditions. And with the lower kiln shell temperatures that result from the use of insulating firebrick linings, less kiln expansion and contraction is to be expected when atmospheric changes take place and that, in turn, can well mean less wear on tires and trunnions.

Still another advantage is the ease and speed with which insulating firebrick linings can be installed. Kiln shells within the zones where insulating firebrick linings have application

(Continued on page 98)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are usually free of troublesome warpage or bulges and, inasmuch as the brick are tailor-made for size and very light in weight, bricklaying can move along easier and faster than when installing conventional fireclay brick linings, and very much faster than when installing combination linings of fireclay brick laid over insulating material.

Life of Lining

The very same factors that affect life of a fireclay brick lining are also present when exposed insulating firebrick linings are used. Accordingly, there is no yardstick or formula whereby one can accurately forecast what lining life to expect. However, based on observations made to date there appears to be no reason why a correctly and properly installed insulating firebrick lining should not be expected to give as long life as would be obtained from the same thickness of fireclay brick lining in the same kiln location and subjected to the same operating conditions. A recent check made on an insulating firebrick lining that has already exceeded five years' life showed it to have lost practically none of its original 4½ in. thickness and in all other respects appears to be in just as good condition as when first installed.

Are There Any Disadvantages?

If the only result of reducing heat loss from the kiln shell would be to increase kiln exit gas temperature in an operation where the increased gas temperature could not be used to advantage in auxiliary equipment, such as waste-heat boilers, preheaters and nodulizers, it is conceivable that there may be instances where the use of insulating firebrick linings would prove to be a disadvantage. Under such circumstances it would be a disadvantage in kilns where exit gas is already so hot as to cause difficulties with chains in a chain system, or too hot for the fan to take care of, or hot enough to cause trouble in the precipitators or dust collectors. It is wrong, however, to assume that all the extra heat made available within the kiln would be carried away in the exit gas, for much of it would be consumed in doing useful work on the load material passing through the kiln.

In the latter connection it may be of interest to mention the results of calculations made by a well regarded combustion engineer on the assumption of a normally operating dry process kiln 10-ft. diameter and 330 ft. long in which clinker is burned at 2750 deg. F. to 2850 deg. F. and with the further assumption that all of the heat saved by replacing 6 in. thick fireclay brick lining with 4½ thick exposed insulating firebrick lining was retained by the gas and none of it absorbed by the load material. It was assumed also that with the conventional firebrick lining, exit gas temperature would be 750 deg. F. On the basis of replacing 100 ft. of lining beginning at the feed end his calculations indicated an increase in exit gas temperature of but 42 deg. F., and an increase of but 116 deg. F. if the replacement extended over a distance of 200 ft. from the feed end. These calculated increased gas temperatures would, of course, be considerably less if it were known what portion of the extra available heat is transferred from the gas to the load and they would be higher if the calculations were made for insulating firebrick lining thicker than 4½ in.

To summarize, the following are the advantages which can be realized by the use of insulating firebrick for exposed lining in rotary cement kilns:

Lower kiln shell temperature.
Lower heat loss.
Better conditioning of load material before entering the burning zone.
More uniform internal kiln conditions irrespective of changing external conditions.
Greater effective cross sectional area.
Greater exposed surface area.
Better thermal spalling resistance resulting in smoother lining surface to reduce dusting.
Lower kiln weight with less wear on tires and trunions.
Less torque and deflection in kiln shell.
Lower power requirement.
Higher exit gas temperature, if desired.
Easier and speedier installations.
Low first cost without sacrificing lining life expectancy.

The use of insulating firebrick for exposed lining in rotary cement kilns is such a relatively new development that no one has as yet made a direct comparison of two kilns of the same size running side by side under operating conditions that are identical with the exception that one is lined in conventional manner with fireclay brick and the other with maximum practical length of exposed insulating firebrick. Until several such comparative tests have been made and actual data become available, the true effect on production, fuel consumption and exit gas temperature will not be known.

SAFETY WINNER

(Continued from page 86)

what might have happened if workers hadn't been wearing their safety gear have been shown to Thornton workers. Perhaps the most dramatic exhibit is a hard hat which saved one man's life twice within a period of two months. In each case, the workman, operating a drop ball near a quarry face, was hit by a large rock which probably would have killed him. The fact that the hat is punctured in both places is mute evidence of this fact, and points up a moral which few workers ignore.

Every accident at Thornton, no matter how minor, is analyzed in an effort to prevent it from happening again. Thanks largely to this facet of the safety program, water tanks on the firm's ready-mixed concrete trucks were recently modified, and another potential hazard was removed.

The change was made after two near-accidents. In each case, workmen preparing to fill the tank forgot to open an air release valve before unscrewing the water tank cap. As a result, the cap, when loosened, shot several feet up into the air, both times narrowly missing the workman involved.

New cap assemblies were recently designed which replace the air-release valve with air holes in the thread of the cap. Now, the air inside the tank is automatically released when the cap is loosened a few turns.

"This close, continuing watchfulness, combined with careful followups of all accidents, are two of the primary ingredients for an efficient safety program," points out the company's safety director, Arvid Tienson. "The third ingredient is wholehearted cooperation from all levels of management. Given these factors, any company can duplicate our record."

SLAG PRODUCTS

(Continued from page 80)

facture is the millability. The diagram in Fig. 15 serves to show that there exists almost a linear relationship between the liter/weight and the millability of the slag (G. Mussgnug: Zement, vol. 31, pp. 183-193). Slags can be designated as easily millable whose liter/weight lies between 300 and 600 gm.; slags with a liter/weight between 600 and 1000 gm. are mediumly difficult to mill and those difficultly millable are finally slags whose liter/weight lies above this figure.

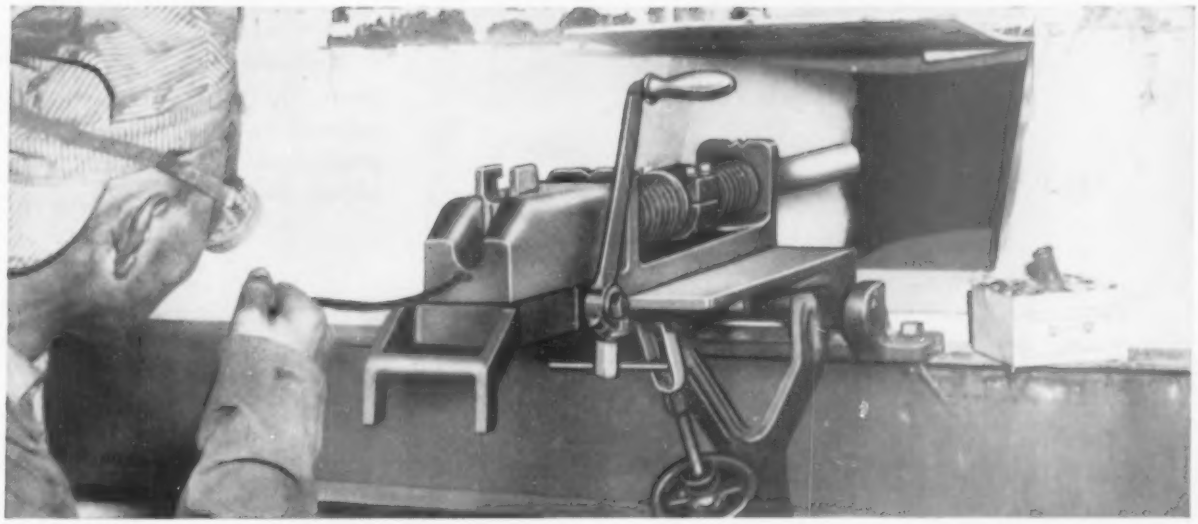
Corresponding to these figures, the power consumption for an easily millable slag amounts for example to about 30 kw.h./ton; for a difficultly millable slag on the other hand, the power consumption can rise up to 70 kw.h./ton. In accordance with the various power consumption figures, the actual milling costs fluctuate. Thus, the millability must receive attention when appraising the price of a slag.

A decisive factor for the increased use of blast furnace slag in cement production is the question of price. The price of the cement-addition slag, delivered to the cement plant, will be conditioned greatly by the freight charges for handling.

References

Processes for the Production of Slag Sand: P. Grossstueck, Stahl und Eisen, vol. 74, No. 16, pp. 1011-1016

Slag in the Cement Industry: G. Mussgnug: Stahl and Eisen, vol. 71, No. 6, pp. 294-297.



Time cut 112 to 1 in removing kiln rings with the REMINGTON INDUSTRIAL GUN

VARIOUS MOUNTINGS ARE POSSIBLE with the Industrial Gun. Here's one of the most common: secure a 6" or 8" "I" beam across the face of the kiln and simply hook the mount into the bolster. The gun can also be mounted on a truck, a tripod, or a mobile chassis for shooting down obstructions in mines or quarries.

26 hours per month production time gained by refractory plant

"We save 222 man-hours per month—and gain 26 hours' production time!" That's how the superintendent of a large refractory plant in Georgia sums up the reasons he's sold on the Remington Industrial Gun. Formerly, removal of kiln rings took 8 men an average of 28 hours per month. Two men now do the same job *in one hour*.

Hundreds of plants have found the industrial gun to be the fastest, most efficient method for ring removal. In seconds, one man can aim, load and fire the gun. A few shots loosen the ring . . . cause it to crumble when the kiln is rotated. There's never any need to cool and reheat the kiln. *Downtime is cut to a minimum!*

Use of the Remington Industrial Gun can mean big savings in labor, big gains in production for you. Our technicians will be glad to work with you on ring-removal problems at your plant. Just send the coupon for a free illustrated folder with complete information.

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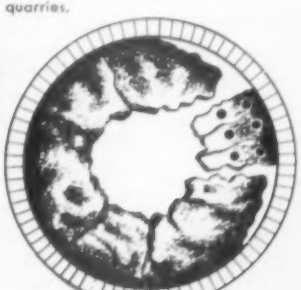
REMINGTON INDUSTRIAL SHELLS have tremendous smashing power. They're loaded with a powerful 3-ounce lead projectile that develops 7,475 foot-pounds' muzzle energy.



CUTTING A "KEY-WAY." A few well-placed shots loosen a section of clinker. The ring is weakened by this loss of the arch key . . . will usually fall without additional shots when the kiln is rotated.

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Over-all view of plant which produces 80 t.p.h. of completely processed and sized lightweight slag aggregate

• Standard Slag Co., Lordstown, Ohio, uses portable dust collector and dryer to increase production of highway and airport paving materials

Boost Bituminous Mix Production In Lightweight Slag Aggregate Plant

AT THE LIGHTWEIGHT SLAG-AGGREGATE PLANT of Standard Slag Co., Lordstown, Ohio, employment of a rotary drum dryer and multiple cyclone dust collector, has resulted in a capacity increase of nearly 100 percent. This equipment was introduced into the processing plant for the purpose of reducing the moisture content in the raw slag as received at the plant.

The two pieces of construction equipment, made by Barber-Greene Co., are part of one of the manufacturer's continuous-mix asphalt plants, widely used here and abroad in the construction of roads and airport runways.

Virtually all of the slag comes from the mills of Youngstown Sheet and Tube Co. In its raw state, it has a high moisture content. Prior to the installation of the dryer, this excessively moist material clogged crushers, blinded screens and, during the winter months, often froze solid during its screening.

Since the asphalt plant equipment, with which the dryer and dust collector were designed to work, is a portable one, both units are mounted on a self-contained chassis and required no structural steel work, other than simple jack-leg supports, for their erection. Further, since both units were designed to work outside, it was necessary only to have them brought to the plant and set up adjacent to the point of entry of the raw slag. It was not necessary to interrupt the normal operation of the plant during the installation of the auxiliary equipment.

When the installation of the dryer and dust collector had been completed, the flow of raw slag into the plant was simply diverted into the reciprocating feeder which is an integral part of the dryer. The dryer consists of a rotary drum, in which curved lifting flights repeatedly elevate the aggregate, then let it drop, in free fall, through a blast of hot gas and flame provided by a fuel oil burner. This exposes every surface of every particle to the heat, speeding drying and effectively driving off the moisture.

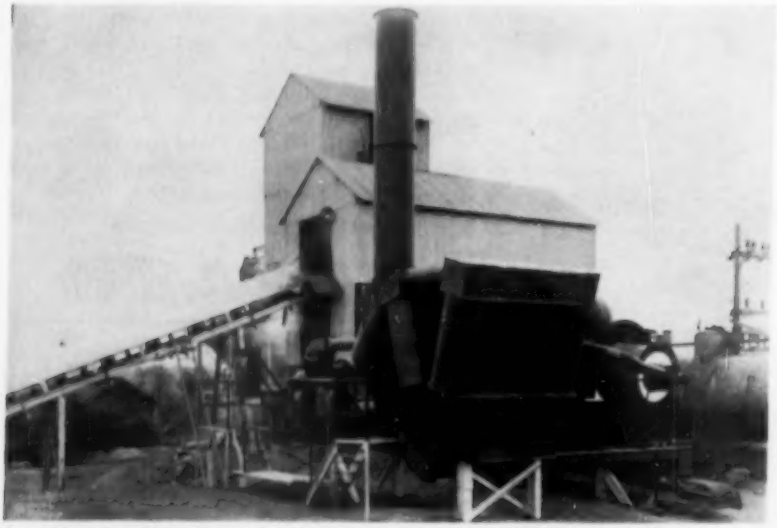
The draft from the dryer's stack is drawn off by the dust collector and this dust-laden, heated air, is passed through the cyclone type precipitators. The reclaimed dust is returned to the discharge end of the dryer by means of a screw conveyor and recombined with the larger particles of aggregate which emerge at that point.

In the Standard Slag installation, the discharge of the dryer and dust collector is deposited onto a belt conveyor running straight back beneath the dryer, into the plant for screening, crushing and sizing.

The final product of the plant is made in two sizes; the coarse passing a ½-in. screen, retained on a ¼-in. and the fine being all that material which passes the ¼-in. screen.

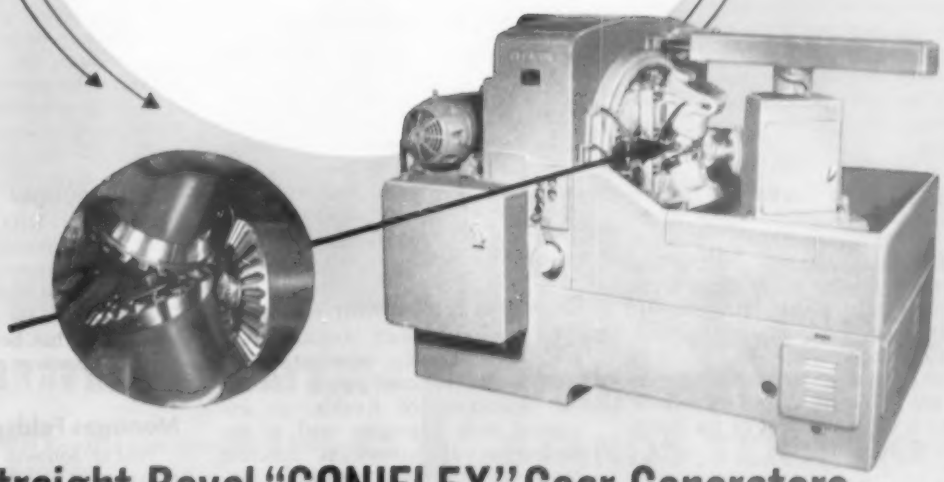
Before the installation of the drying equipment, the Lordstown plant

(Continued on page 102)



Beneath dryer, to the right, is the belt conveyor which carries dried aggregate into the plant. Multi-cyclone dust collector, to the left, reclaims fines which are returned to the belt conveyor beneath dryer for further processing

Something New at ILLINOIS GEAR



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averaged 40 to 50 t.p.h. of finished product. Now, this hourly capacity has been increased to approximately 80 t.p.h., the result of more free passage of material and more efficient screening.

In spite of the very high moisture content of the raw slag, a phenomenal percentage is removed in the drying process. In passing through the dryer, the aggregate is heated to 150 to 180 deg. F. and the moisture content is reduced to as little as 12 percent. A little over 2 gal. of No. 2 fuel oil is required for each ton of aggregate processed. The dryer is equipped with a low-pressure fuel oil burner and the pressure for atomization is provided by the fan system employed for draft on the dust collector. The dryers may also be equipped with natural gas burners, or with high pressure fuel oil systems where steam is used to effect the atomization of the fuel.

The slag processed by the Lordstown plant is used extensively in the manufacture of lightweight concrete block. In addition to being easy to screen and crush, the dried slag is also very desirable for use in automatic concrete block machines because of the uniformity of its moisture content.

The Model 837 Barber-Greene dryer is normally rated, for construction work, at 100 to 160 t.p.h., but in this type of work, the moisture content of the raw aggregate rarely exceeds 6 or 7 percent. Similar rotary drum dryers are obtainable in sizes rated from 10 to 200 t.p.h., each with appropriately sized dust collections.

The general offices of Standard Slag Co. are in Youngstown, Ohio. G. W. Lehto is superintendent of the Lordstown plant.

Assistant Advertising Manager

RAY A. BARNHART has been appointed assistant manager of advertising and public relations for the Marietta Concrete Corp., Marietta, Ohio, in addition to his duties as sales representative in the Beslite division of the company. Since joining the firm in 1955, Mr. Barnhart has been engaged in sales analysis for the industrial bin and precast wall panel departments, later transferring to the Beslite sales department. A native of Elgin, Ill., Mr. Barnhart graduated from Marietta College and attended the University of Houston, where he received his M. A. degree.

Heads Builders Exchange

LEE H. HINDER, vice-president, Anderson Concrete Corp., Columbus, Ohio, was recently elected president of the Builders Exchange of Columbus.

Executive Vice-President

JOHN F. PARKER has been elected executive vice-president and director of the Kickapoo Sand and Gravel Corp., Peru, Ind., also of the parent firm, J. C. O'Connor & Sons, Inc., Fort Wayne, Ind., and the O'Connor Construction Co., Springfield, Ill. He was formerly vice-president of the O'Connor Construction Co. Robert E. O'Connor was re-elected president of the O'Connor firms.

General Manager

RICHARD E. SANSOM has been appointed manager of all divisions of the American Limestone Co., Knoxville, Tenn. He was formerly manager of the crushed stone division. R. B. McNab has been named sales manager of the agricultural limestone divisions in addition to his duties as manager of the central division in St. Louis, Mo. Mr. Sansom has been with American Limestone Co. for 13 years.

Longhorn Appoints Officers

W. M. THORNTON has been elected executive vice-president and general manager of the Longhorn Portland Cement Co., San Antonio, Texas. He was formerly vice-president and manager. Carl A. Barlow has been appointed secretary and treasurer, and R. H. Stewart Mitchell, sales manager, has been named vice-president in charge of sales.

Operates Second Kiln

KENTUCKY LIGHT AGGREGATES, INC., Louisville, Ky., recently started operation of a second rotary kiln for the production of Kenlite, an expanded shale aggregate used in the production of lightweight concrete block and lightweight structural concrete. The Kenlite plant, which started operations about 2½ years ago, is a wholly owned subsidiary of the Ohio River Sand Co., Inc., and is designed to eventually operate four kilns. The two present kilns are producing aggregate at a rate of 320 cu. yd. daily. The company operates its own shale quarry, and its estimated reserves amount to an 80-year supply for four 8- x 125-ft. kilns.

Assistant Sales Manager

HAROLD A. LOVEGREEN has been appointed assistant sales manager of Calaveras Cement Co., San Francisco, Calif. He joined the company in 1953 and was formerly stationed in Los Angeles as white cement sales representative for southern California, western Nevada, Arizona and Utah. He received his engineering degree from the University of California, Berkeley, Calif.

Hummel Named General Manager of Consumers

ROBERT J. HUMMEL, vice-president, has been named general manager of the Chicago division of Consumers Co., Chicago, Ill., in addition to his duties as vice-president. T. E. Stumm, also a vice-president, has been placed in charge of gravel and quarry operations in Illinois.

Plant Manager

EDWARD J. KILLIAN, formerly production superintendent, has been promoted to manager of the Portsmouth, N. H., plant of National Gypsum Co., Buffalo, N. Y. He succeeds Alfred C. Olsen, who has been appointed manager of the new gypsum plant at Westwego, La.

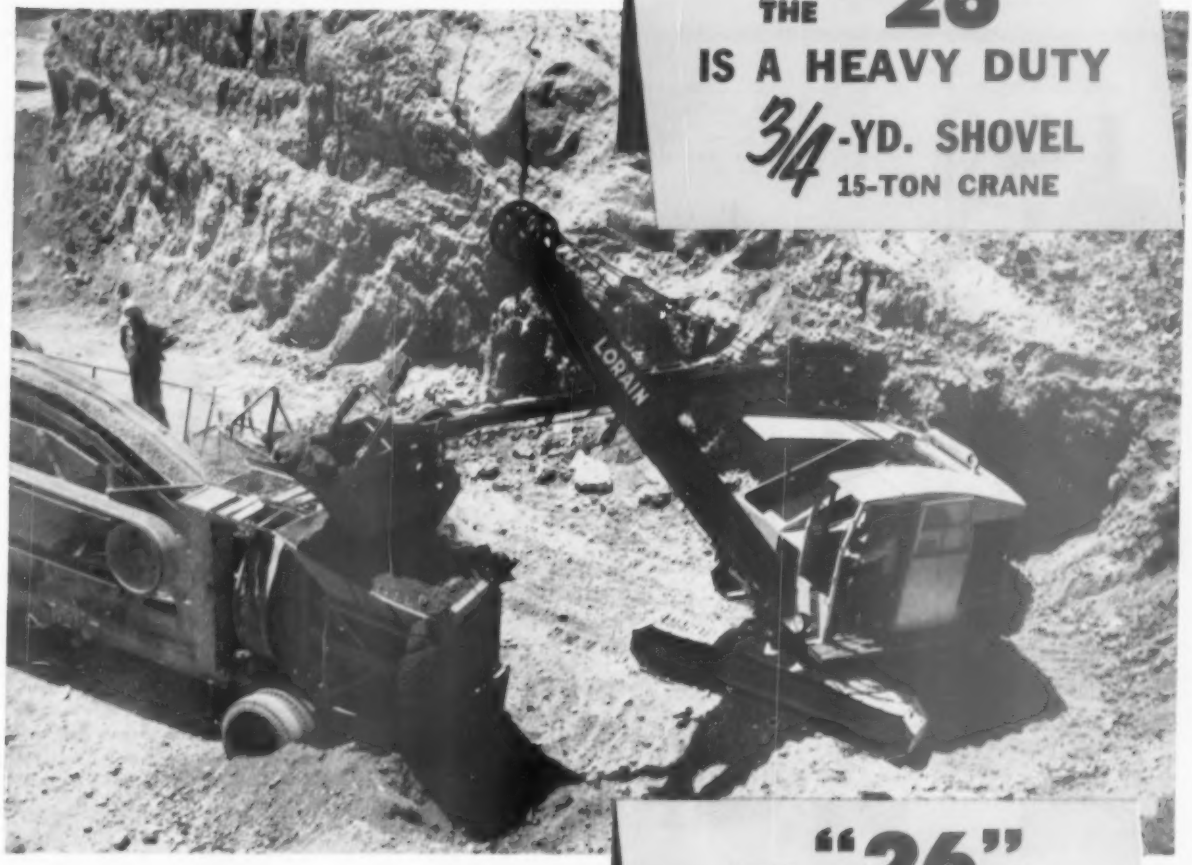
Manages Feldspar Operation

Neil O. Johnson has been appointed manager of the Kings Mountain, N. C., feldspar mining operation of Foote Mineral Co., Philadelphia, Penn.

Kentucky Light Aggregates, Inc., operates two rotary kilns, producing 320 cu. yd. of expanded shale aggregate every 24 hr. Eventually the plant will operate four kilns

LORAIN SAYS . . .

THE "26" IS A HEAVY DUTY 3/4-YD. SHOVEL 15-TON CRANE



ALBANY GRAVEL CO. SAYS...

THE "26" "CONSTANTLY STANDS TERRIFIC DIGGING STRAIN"

AND HERE'S WHY—this combination of features found in no other machine!

New Lorain "E-Z" Controls • "Big Look"—larger, wider cab for greater operator comfort • "Hydra-Ease" power control of crawler steering, tread lock, house lock and shifting of swing-travel jaw clutches.

Hydraulic Coupling power take-off for no-stall, no-shock, "never-say-die" smooth application of power • No digging shocks transferred to mechanism.

5 identical, Interchangeable Shoe Clutches • Bigger clutches with 18% more capacity, plus new, easier action, longer-life design • 19 anti-friction bearings on power shafts and clutch drums.

19 ft. shovel boom for maximum reaches—powerful, independent cable crowd • Much greater weight—over 47,000 lbs. as a shovel • 15-ton crane capacity with 2-piece pin-connected boom • Power load lowering standard • Ability to back-down the load • Third Drum available.

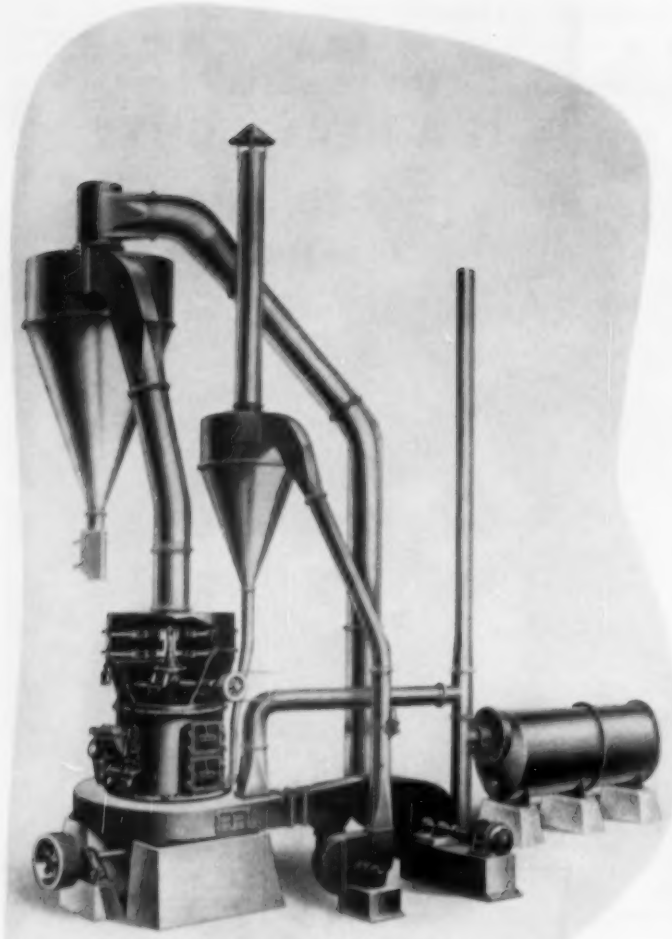
Newly-designed, sturdier, wider, 2-speed Crawlers with 29-inch wide drop-forged treads • 2 crawler speeds in both directions • Oil-enclosed crawler travel mechanism • 4-way, positive Tread & Travel Lock—fully enclosed.

Truss-type Turntable Bed • Hook Rollers—front 2 are on anti-friction bearings.

The best test for any shovel is on the job. That's where product claims must be proved . . . and that's why Partner and Manager C. R. Davis of the Albany Gravel Co., Albany, Mo., says far more in these words than any claims Lorain may make . . . *"Our Lorain-26 is used for digging natural gravel from a solid deposit. It stands terrific digging strain constantly and takes hard digging abuse exceptionally well."* This is just one owner's reaction to the new Lorain-26. See your Thew-Lorain Distributor. He can show you Lorain-26's at work.

THE THEW LORAIN®

THE THEW SHOVEL CO., LORAIN, OHIO



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Today's advanced design in *roller mill equipment* brings you the latest operating features to help reduce costs and improve the quality of your products.

If you want to hold the competitive advantages of modern production methods, then install the Raymond Whizzer-type Roller Mill for grinding limestone, gypsum, clays and similar non-metallic minerals.

- Pneumatic Feed Control keeps a maximum "load" on the mill under all conditions . . . a major factor in Raymond Roller Mill economy.
- Throw-out Attachment automatically rejects ungrindables, insuring maximum capacity, uniformity and refinement of product consistent with the amount of impurities which can be discarded.
- Flash Drying Accessories for removal of surface moisture and delivering a fine, dry, free-flowing finished material.
- Integral Whizzer Separator to give wide range fineness control by instant adjustment, and to increase capacity.
- Oil Journals and internal lubrication that reduce lubrication costs and overall mill maintenance.

For further details, write for Raymond Catalog No. 79

COMBUSTION ENGINEERING, INC.

Raymond Division

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SALES OFFICES IN PRINCIPAL CITIES

Combustion Engineering-Superheater Ltd. Montreal, Canada

INFORMATION

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below

1 AIR LINE RESPIRATORS—Mine Safety Appliances Co. has released Bulletin 1009-8, describing and illustrating air line respirators for protection in atmospheres such as welding and cutting fumes, toxic dusts, paint spray vapors, and fumes from molten metals. Accessories for constant flow and demand flow types are described, as well as portable air line respirator equipment.

2 AIR-WATER HOSE — Raybestos-Manhattan, Inc., Manhattan Rubber Div., has announced Bulletin 7107, describing the Super-Master BW air and water hose, constructed of braided wire for extra safety at pressures up to 2000 p.s.i. Advantages, specifications, uses and fittings are listed.

3 BALANCED SCREEN CONVEYORS—Williams & Green has issued a brochure describing and illustrating IMCO balanced screen conveyors. Specifications, features, and typical application photographs are included.

4 BLAST AND VIBRATION SEISMOGRAPH—W. F. Sprengnether Instrument Co., Inc. has brought out a brochure entitled "Sprengnether Portable Blast and Vibration Seismograph." Data on power requirements, operating characteristics, the seismometer system, interpretation service, etc. is included. Specifications and a graph showing seismograph response characteristics are also given.

5 BLOWER-COOLED MOTORS—The Louis Allis Co. has released Bulletin 1800, entitled "Louis Allis Rapid Reversing Motors." A cutaway view is featured, showing the construction of a blower-cooled motor capable of more than 200 idle reversals per minute. Formulas on inertia and motor reversal calculations are also given.

6 CONCRETE HANDLING TECHNIQUES—Hyster Co. has issued a set of three "Field Reports," describing savings in concrete handling techniques. Company operations described are those of Faber Cement Block Co., Paramus, N. J.; Chicago Block Co., Chicago, Ill.; and Janesville, Wis.

7 CONCRETE MIXER—Kwik-Mix Co., subsidiary of Koehring Co., has released a catalog describing the Model 6-S Dandie concrete mixer. Construction features of the unit are explained, and typical application photographs and parts photographs point out its advantages.

8 CONVEYOR—American Conveyor Co. has literature available describing and illustrating the "Con-Vay-It" conveyor for building materials. Typical application photographs and specifications are included.

9 CRANE ELECTRIFICATION—The Cleveland Crane & Engineering Co. has released Catalog 2021-A, on its line of Inverted-Y Electrification for application on cranes and runways. Drawings are given, as well as data necessary for ordering the aluminum Inverted-Y conductors, supports, and collectors for applications requiring current in amounts of 300 to 1000 amperes.

10 CRANE-EXCAVATOR — Schield Bantam Co. has issued Bulletin CR-501, describing the self-propelled Model CR-35 Bantam crane-excavator. Specifications, features, operating data and capacities of the ⅜-cu. yd., 6-ton unit are given. Charts show lifting capacities for crane, shovel, and back hoe attachments.

11 DISC ROLL MILL—Hardinge Co., Inc., has brought out Bulletin 52, an eight-page catalog which describes the details of operation and application of the Disc Roll Mill. Typical application photographs and advantages are included.

12 DOME ROOF CONSTRUCTION—Gunite Contractors Association has released Bulletin 126, entitled "Dome Roof Constructed with Gunite." Construction details are described for the job entailing Guniting a tapered dome-shaped roof slab 106 ft. in diameter and 20 ft. in height.

13 DREDGE PUMPS—Morris Machine Works has prepared Bulletin 184-A, describing the "GA" and "GAF" dredge pumps, which include 24 models ranging from 6- to 20-in. sizes. Hints on maintenance of initial pump efficiency and choosing a dredge pump that best fits a particular need are discussed.

14 ELECTRIC MOTORS—The Louis Allis Co. has published Bulletin 1700, entitled "The New L. A. Line of Electric Motors," describing open drip-proof, as well as enclosed and explosion-proof, electric motors. Photographs, cutaway views and explanatory technical drawings point out performance and application features.

15 EXPLOSIVES HANDLING—Atlas Powder Co., Technical Division, has prepared a revised list of instructions and warnings on the proper handling and use of explosives and blasting supplies, approved by the Institute of Explosives Makers. A list of 72 "Do's and Don'ts" are given, and approved methods for priming an explosive cartridge with both cap and fuse and with electric blasting caps are described and illustrated.

16 GREASE ANALYSIS—The Texas Co. has published Vol. XLII, No. 1 of "Lubrication," featuring an article entitled "Grease Analysis." Tables are given on laboratory methods for testing greases; general characteristics of greases; and a simplified scheme of grease analysis.

17 HEAT EXCHANGER—Western Precipitation Corp. has brought out a catalog, No. HF 102 5M 12-54, describing and illustrating the "Holo-Flite" processor, an indirect heat exchanger for cooling, heating, drying, etc. Data is given on applications, space required, construction and operation. Features and advantages are listed, and typical installations are shown. Specifications and dimensions are also included.

18 HEAVY DUTY BULK SCALES—Richardson Scale Co. has announced Bulletin 8946A, describing three models of the Class 38 automatic weighing unit for bulk materials. Construction, operation, feeding arrangements and capacities for the scales are discussed. Gravity, belt, screw and vibrating feed arrangements are shown in diagram, and special features are described and illustrated. A list of over 120 materials that the scales can handle is included, and a line of accessories is discussed.

19 INDUSTRIAL RUBBER GOODS—Hamilton Rubber Manufacturing Corp. has released a 72-page catalog on hose, belting, packing, molded and lathe-cut rubber goods and mats. Data is given on sizes, weights, applications, construction features, and other material pertaining to product use.

20 INDUSTRIAL TRUCK COSTS—The Elwell-Parker Electric Co. has issued a folder, entitled "How to Figure Your Industrial Truck Costs," covering the cost of truck ownership and truck operation. A cost checklist is also included, which contains 16 points to be considered in such an evaluation.

21 IN-LINE HELICAL GEAR DRIVES—Link-Belt Co. has published a 16-page book, No. 2651, describing and illustrating its in-line helical gear drives. Load classes for over 250 applications, overhung load ratings and dimension tables, instructions for proper selection and cutaway views of both double and triple reduction drives are given.

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22 **LABORATORY EQUIPMENT**—Fisher Scientific Co. has published the Spring, 1956, issue of "The Laboratory," featuring articles and announcements of instruments, reagents, and laboratory apparatus. Among the instruments described is the Fisher-Gulf Partitioner for automatic qualitative and quantitative analysis of gases and volatile liquids.

23 **MATERIALS HANDLING EQUIPMENT**—Towmotor Corp. has issued three four-page brochures covering the entire line of fork lift trucks, tractors and accessories. One folder gives standard specifications on the available fork lift truck models, and the other two folders outline phases of engineering research and development related to accessories.

24 **MECHANICAL FLOWMETER**—Minneapolis-Honeywell Regulator Co., Industrial Div., describes mechanical flow meters with evenly graduated charts and scales in Specification Sheet 242-2. The meter body, which is a characterized bell float, is mounted integrally with the measuring instrument, forming a self-contained measuring system for pipe stand or panel mounting close to the point of measurement.

25 **MOTOR GRADERS**—Allis-Chalmers Manufacturing Co., Construction Machinery Division, has released a 16-page catalog, No. MS-459, describing the design, engineering, construction and performance of the 50-hp. Model D motor graders. Cutaway views, photographs of components, combustion graphs and other illustrations point out the features of both the gasoline and diesel engine motor graders. Attachments and accessories are shown, and specifications are listed.

26 **MULTI-V BELTS**—B. F. Goodrich Co., Industrial Products Div., has brought out a data sheet on its line of Multi-V belts. Grommet V-belts, high capacity Grommet V-belts, high capacity static conducting belts, oil-resisting V-belts and Double-V belts are included. A chart shows standard and high capacity V-belt numbers, sizes and pitch lengths. An interchange list for Multi-V belts is also included.

27 **PERFORATED MATERIALS**—The Harrington & King Perforating Co. has published a 128-page general catalog, No. 62, of perforated materials. Different standard patterns are illustrated in actual size, and information is given regarding hole size, centers and percent of open area. Data is also included on fabrication facilities, ordering, materials that can be perforated, and a list of perforated sheets carried in stock.

28 **PILOT PLANT DRYERS**—Hardinge Co., Inc. has brought out Bulletins AH-471, AH-472, and AH-473, describing the Model XH-XF gas fired dryer, the Model XB gas fired rotary dryer, and the Model XC steam tube dryer, respectively. Drawings and photographs are used to illustrate the selection of self-contained pilot plant or laboratory size Ruggles-Coles rotary dryers.

29 **PORTABLE HUMIDITY RECORDERS**—The Bristol Co. has released Bulletin H1008, describing and illustrating its line of portable recorders for relative humidity and temperature. Samples are shown of typical records made by the "Thermo-Humidigraph" recorder. Permanent mounting models are also illustrated.

30 **PRE-FAB FOUNDATION SYSTEM**—Simplex Forms System, Inc. has brought out Bulletin F-1026, describing and illustrating a system of forming foundation walls for "Floating Slab" pre-fabricated homes. The operation is described in step by step detail.

31 **PRESSURE CONTROLLER** — Minneapolis-Honeywell Regulator Co., Industrial Div., has issued Bulletin 7040, describing the Honeywell small-case Indicating Pressure Controller, available in ranges from 0-50 to 0-200 p.s.i., with on-off or 10 percent Throttler control. The case matches that of the small-case temperature controller.

32 **PUMPS**—C. H. Wheeler Manufacturing Co. has announced Catalog A-155, describing and illustrating Wheeler-Economy Type M pumps for medium and high head services. Cross sections of design are shown for bottom suction and side suction types, and construction details are given.

33 PRODUCT LITERATURE DIRECTORY—Allis-Chalmers Manufacturing Co. has released a 24-page directory of product literature, entitled "This is A-C From A to Z." In addition to an alphabetical description of company products and their descriptive literature, the directory also has a brief history of Allis-Chalmers as an introduction. The location of the firm's 17 plants, sales offices and tractor branch houses are also listed.

34 RAILROAD CRANE—Koehring Co. has released an eight-page pictorial bulletin describing the mechanical and application features of the self-propelled RailAid crane which works either on or off its own rail car, lifting 6.9 tons on the car, and 8.9 tons on the ground. The bulletin also presents a summary of other products that can be applied to railroad work.

35 SCALPING SCREEN—Allis-Chalmers Manufacturing Co. has brought out Bulletin 07B8368, entitled "Allis-Chalmers ROM Vibrating Screen," describing the Model XXH, run-of-mine vibrating screen which is said to be capable of handling pieces of ore weighing up to four tons without transmitting shock loads to bearings. Ten features of the scalping screen are enumerated.

36 SIX-WHEEL TRUCKS—International Harvester Co. has announced a 24-page catalog, No. CR-860-E, giving data on conventional and cab-over-engine six-wheel trucks. Full-color and two-color photographs are used to present design and operating features of the line, which include S-line, R-line, and CO models, powered by gasoline, diesel, or LPG engines.

37 SPEED REDUCERS — Farrel-Birmingham Co., Inc., has prepared a 52-page bulletin, No. 450, entitled "Farrel Speed Reducers." Data is given on the complete line of speed reducers, which was recently re-engineered, rerated and expanded. Horsepower rating tables, specifications, dimensions, weights, and other data are included.

38 SYNTHETIC FLUIDS AND LUBRICANTS—Carbide and Carbon Chemicals Co. has issued a 52-page booklet on Ucon synthetic fluids and lubricants, covering properties, applications, and characteristics of the polyalkyleneglycol derivatives. Tables, charts and photographs are included.

39 TRACTOR SHOVELS—Pettibone Mulliken Corp. has announced the availability of a bulletin describing Speedall tractor shovels with Speedmatic power shift transmission. The units are available in three sizes with 1¼-, 1¾-, and 2½-cu. yd. truck capacities.

40 TUBELESS TRUCK TIRES—The B. F. Goodrich Co., Tire and Equipment Division, has released a 12-page booklet, entitled "All You Need to Know About Tubeless Tires for Trucks." Tire mounting, demounting and repairing is explained, and recommended rims are described. Photographs and drawings illustrate each topic, and advantages are listed.

41 V-BELT DRIVES—Allis-Chalmers Manufacturing Co. has announced a 36-page pocket size booklet, No. 20E8297, discussing the origin, history and development of multiple V-belt drives. The evolution of standards in engineering V-belt drives is discussed, and modifications in drives are described. Tables and questions and answers relating to basic principles and practices in the engineering and use of multiple V-belt drives are given.

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"TOUGH AS A MULE"

–and fast, too!

THAT's the verdict of Ed Walker, job super for H. G. Cozad Construction Co., on a job near Roff, Okla. This agile CAT* DW15, shown with No. 15 Scraper, had just been driven 90 miles in three hours from a shut-down job to this one!

The Caterpillar DW15 is stripping clay overburden so that sand can be quarried for the Roff plant of Mid Continent Glass Co. The big yellow machine works 10 hours a day, six days a week, with time out only for bad weather. According to Ed Walker, "There just isn't any other equipment like Caterpillar machines. They move a lot of dirt without giving us any trouble."

H. G. Cozad is 90% standardized on Caterpillar. In addition to this DW15, the firm owns two Cat DW21s and three DW10s with scrapers, seven Caterpillar track-type Tractors, and a No. 12 Motor Grader. About two-thirds of the equipment is on this job, moving 6000-7000 cu. yd. of overburden per day over a quarter-mile haul.

That's high production, especially with a 100-ft. unfavorable grade on the haul road. The fast-moving DW15 can highball at speeds up to 24 m.p.h. for fast cycle times. Its four-cycle Caterpillar Diesel Engine develops 186 HP, and puts out maximum torque when slugging through tough going with heavy loads. Its companion No. 15 Scraper has a capacity of 15 yd. (heaped), and features fast loading with a live, "boiling" action, and positive ejection of sticky materials.

There's a full line of rugged, fast-working Caterpillar rubber-tired Tractors and Scrapers. Your Caterpillar Dealer – who provides fast service and parts you can trust – will gladly demonstrate the unit best suited to your needs.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

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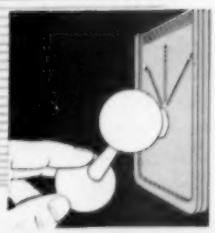
WILL DEMONSTRATE**

Are you losing 10% of a day's production every time you change crusher setting?

One-man, One-minute PRODUCT CONTROL



● On some gyratory crushers, it takes 45 minutes and longer to change setting for different product size — in many instances, it takes hours. But even 45 minutes of downtime represents about 10% of your day. You don't have to put up with this lost production —not if you install the *Hydrocone* crusher, the crusher with one-man, one-minute product control.

With the *Hydrocone* crusher (and *only* with this modern crusher) you can change product size at the flick of a switch. Compensating for wear is accomplished just as easily. And if the *Hydrocone* crusher stops under load, just flick the switch and you're in business again.

Get all the facts about the *Hydrocone* crusher. See your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 07B7145B.

A-4931

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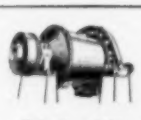
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JOY TWM-5 CHALLENGER DRILL

the BIG DRILL that has EVERYTHING

80° DRILLING RANGE

The Joy TWM-5 Challenger will drill at any angle between vertical and 10° above horizontal, making it applicable to almost any range of drilling required.

EXTREME MOBILITY

The TWM-5 is self-propelled on either rubber tires or crawler treads. It is driven on each side by a reversible piston type air motor, can turn in its own length, and can move into and out of most "tight" spots.

REMOTE CONTROL

All functions of operation, both drilling and moving, are controlled from the operator's station on the frame, directly over the left front wheel. Three hydraulic jacks provide stability while drilling.

TM-500 DRILL

The drilling machine on the TWM-5 is the JOY TM-500, a 5¼" piston drill, which has proved itself in quarry, construction, and mining work as the first and still the leader in the big drill field. The TM-500 is mounted on an extra sturdy mast which is raised and lowered hydraulically.

ADDITIONAL FEATURES

Optional features available on the TWM-5 are a cab, designed for the best in operator comfort and protection, and a dust collection system.

Check today on the Joy TWM-5 for your drilling operation. Whether you drill vertical holes or toe holes, it will fit your program and give added rock tonnages from the day it first goes to work. Write for complete information today to ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Joy TWM-5 drilling deep holes (50' to 100') in granite in a southeastern quarry.

Write for FREE Bulletin 19-27

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JOY

CONSTRUCTION EQUIPMENT MANUFACTURERS
FOR OVER HALF A CENTURY

SAFETY—

The Foreman's Job

By C. A. GUSTAFSON

TOO OFTEN FOREMEN ARE PICKED because they are the top-notch workers of their particular gangs or in their skills. Modern business trends have shown that in a multitude of cases this type of foreman selection is entirely wrong, and brains — not brawn — make the better foremen.

Since this article is particularly concerned with safety, let us examine what management should expect of foremen in the accident prevention field. We must first assume that management has a definite safety program. The logical men to carry out this program are the foremen, who are supervising the hourly workers throughout the shift. Once management has sold a foreman the idea of safety, his crew becomes safe workers because they know he will not tolerate anything that borders on hazardous methods of accomplishing their daily tasks. His eye is on them at all times, and while in many cases his crew is split up and scattered he (if he is a proper foreman) will visit each section periodically, and thus check on work already performed and also advise as to future tasks.

A wise foreman will lay out future tasks with an eye to the safe methods of accomplishment and will see to it that his ways of doing them are followed. He is entitled to assume that his orders will be followed, and when he finds "scofflaws" in his gang he soon either changes their behavior or, as a last resort, gets rid of them. He does this because an unsafe worker not only is a hazard to himself but also to every man in the crew. He is justified in letting go an habitual chance-taker or whatever foolhardy individual he may have.

The foreman in a modern setting will spend some time in explaining and showing a new man the dangerous aspects of the job. During this time he will elaborate on the safety program of the company and what management expects from the individual as to safety. Some firms have the Employment Department outline the general program to a new hand, but it is directly up to the foreman to teach him about the particular hazards he will encounter. Merely telling the new man "don't do this — or that" isn't sufficient. He must explain WHY. When a man is cognizant of what may happen if he proceeds unsafely, he usually will be loth to take a chance and do it differently from the way the foreman laid out.

Management Responsibility

Management has always looked to its foremen to not only "get out the work" but also to pass along to the men the policies and program of the company. When foremen understand that management means it wants its safety program developed, these supervisors usually go all out to see that the firm's wishes are fulfilled. Direct supervision (which is the general lot of a foreman) certainly can make or break management's standards. A foreman therefore should be made to feel partially, not wholly, responsible for an accident occurring in his crew. Many "Top Brass" make a practice of questioning a foreman after an accident to find out *why* the mishap occurred. By doing this the foreman is not only made further aware of management's interest in safety, but through such questioning will enlighten him on how to prevent a recurrence. No foreman likes to have to explain to management why a similar accident occurred twice.

Many foremen feel that safety is all right, but like peace, no one does much about it. They feel that speed and brute strength will give more production than any other two factors. These are the foremen who continually shout at their men "What are we waiting for?" "Hurry up — you're not getting paid to think; I'll do your thinking," and a host of other phrases that keep men in a state of constant fear and nerves. Far too many accidents occur in gangs bossed by such foremen. I don't believe in molly-coddling a crew, but if by explanation and talking over the job with the men he can get them to work safely, the foreman will accomplish more and at a cheaper rate.

Just look at the wasted time when a member of a crew gets hurt. All production work ceases, until the injured has been cared for, and then when work is resumed it is only at about 50 percent of normal. This is not only true of our industry but true of every industry. A foreman can by his very tone make his crew conscious of the fact that safety is paramount.

Men also work better when they feel safe. Watch any man doing a risky job. He is slow, trying to protect himself and taking twice as long as he would normally take, because he doesn't want to get hurt. This same thing holds true in an operation that has one accident after another. The work slows down involuntarily because of this same fear of getting hurt. There is certainly a difference in production between a safe and a hazardous plant. The foreman has the solution by making the work safe and easing the minds of his men.

Possibly the best foreman the writer has ever known was an old Italian blaster and drill foreman. He never raised his voice, but each man in his crew knew he meant what he said. He was careful in his choice of certain men to do certain jobs. New plug drillers he kept at the bottom of the muck pile until such time as he felt he could trust them to work in higher and more dangerous locations. When men were barring down rock he was in a spot where he could see the entire muck pile, and he watched for any movement of stone. His men loved him and gave a bit more than an average day's work. He took no chances himself and made sure none of his men did either. His department went for years without a lost-time accident, and his labor turnover was at a minimum.

Training for Supervisory Jobs

Most foremen pitch in and give their crews a hand when needed. This is rightly so. But many times a foreman feels he can do certain jobs better and quicker than anyone else. These men sometimes forget that they are not as young as they used to be and sometimes get hurt themselves, due to loss of vigor and carelessness. Instead of this, a good foreman will break in a younger man, or better yet, men; not only to relieve himself of unaccustomed strains but to have men on the job who have been trained to do that work properly. Many organizations have been sore pressed to replace supervisors, because the old supervisors didn't train others to take their places.

In every operation, foremen can see

(Continued on page 116)

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Trencher teeth stay sharper 2 to 3 times longer when hard-faced with HAYSTELLITE tungsten carbide rod. The hard-facing material protects the teeth from severe abrasion as they tear through rock, sand, shale, and clay at high speeds. HAYSTELLITE tungsten carbide has good shock resistance, too, and won't chip off under sudden impact.

On this job, the teeth were made of a tough vanadium steel and faced with a thin layer of HAYSTELLITE tube rod. The combination of a tough base metal and an extremely hard, wear-resistant surface helped to double the continuous service life of the trencher. Other earth-moving equipment subjected to abrasion and impact can be protected in the same way. Bull-dozer blades, dipper teeth, post-hole diggers, road disks and plows, will all operate for long periods of time, at low maintenance cost, when hard-faced with HAYSTELLITE tube rod.

Your local dealer carries a complete line of HAYNES hard-facing alloys. He will be glad to recommend a HAYNES rod especially designed to resist abrasion, corrosion, impact, erosion or heat. Ask him for descriptive literature. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana, for full details.

See... | Your local Haynes Stellite Dealer

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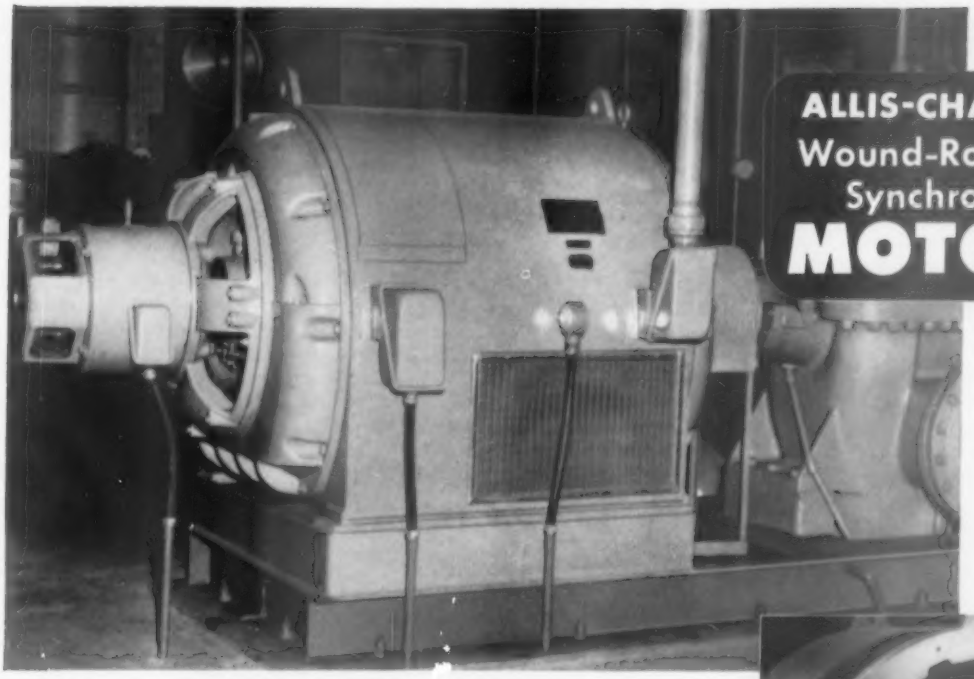


ALLIS-CHALMERS
Wound-Rotor and Synchronous
MOTORS

Shown is a 400-hp, 900-rpm end-shield bearing synchronous motor. Other Allis-Chalmers motors of this design are available from 250 hp at 300 rpm and up, in drip-proof and splash-proof construction.

Now full protection without loss of accessibility

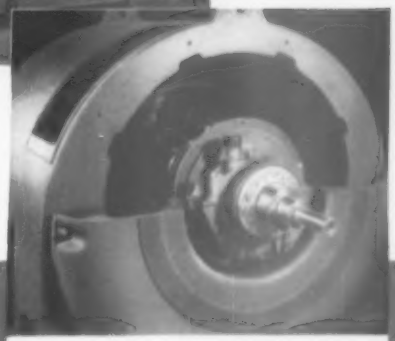
All parts, including slip rings and leads, are enclosed — yet removable inspection covers and end-shield sections simplify maintenance.

These motors combine modern functional design with maximum protection and accessibility.

Here are some of the important features:

- Collectors and brushes are protected by box-type stator yoke from physical damage, dripping moisture, dust and dirt.
- Cast end shields provide rigid bearing support and full protection for motor windings.
- Slip-ring leads are brought out to a terminal box — they are not left exposed.
- Capsule-type sleeve bearings permit inspection or cleaning of motor windings without exposing interior of bearing to dirt.
- Access covers are secured by easy-operating, self-locking fasteners for ready removal.

Get details — Call your nearby A-C office, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 05R8183.



Note accessibility offered by generous size opening covers. Upper half of end shield is removable for entrance to motor winding.

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

A-4847

Time-Saving Cement Analysis

By F. O. ANDEREGG

R. HUPPERTSBERG describes time saving methods for the analyses of calcium, magnesium and iron in portland cement; the slag content of blended cements and the determination of free lime with the aid of the disodium salt of ethylendiaminotetraacetic acid, having the formula:

$NaOOCCH_2$ CH_2-COOH
N-CH_2-CH_2-N
$NaOOCCH_2$ CH_2-COOH

The calcium, magnesium or iron replace the two hydrogens, which may then be titrated with suitable indicators. The reagent may be obtained from the firm, B. Ziegfried of Zofringen, Switzerland. The reagent is used in 0.1*M* solution, 37.23g per liter. After the SiO_2 has been separated from 2.5g of cement the filtrate is made up to 500 ml. and 50 ml. is used for CaO. It is diluted to 200 and about 20 ml. 0.5*N*-NaOH is added to secure a pH of 12, as is shown by Mercks pH paper indicator.

The hydroxides of Fe and Al and Mg are so precipitated, but it is not necessary to separate this precipitate. Add 0.5ml. murexide indicator and titrate with vigorous shaking from a wine red to a blue-violet color. The temperature must be at least 40 deg. C. 1 ml. is equivalent to 2.24 percent CaO. Another 50 ml. is pipetted off and about 50 ml. of buffer solution is added to secure a pH of 10, so that $Mg(OH)_2$ is not precipitated. The temperature must be at least 40 deg. C. (The buffer consists of 1 part of 1*N* NH_4Cl and 5 parts of *N* NH_3) Adding ½ ml. of Eriochrom Black T and titrate from wine red to blue to get the sum of the CaO and MgO.

1 ml. complexion = 4.03 Mg MgO

If the MgO content is less than 0.7 percent, $MgCl_2$ should be added to reach at least 1.5 percent to reduce any errors. This method can be used for cement, clinker, limestone, marl and blast furnace slag. The murexide indicator is a freshly prepared, saturated solution. The Erichrom-Black T can be 0.3g in 50 ml. alcohol.

Iron is determined in HCl solution; using KSCN as indicator, titrating with the complexion, until the red color disappears, which is a very sharp color change.

For the slag content of blended cements, weigh 0.2g and suspend in 100 ml. and add 25 ml. 1*N* HCl from a burette and boil for about 10 min. to effect solution. Dilute to 200 ml. and add 0.5*N* MaOH until the Universal indicator paper shows a pH of 12. Add 1 ml. saturated murexide solution to give an intensive red color. The temperature must be 40 deg. C. The end point, a violet color, is reached only after vigorous shaking. The CaO content of both the given slag and the portland cement must be known, from which a table can be constructed for interpretation of the analytical result.

For determination of free lime, dissolve lg. cement in 30 ml. glycol and 15 ml. methanol with reflux condensor. A few drops of NaOH solution are added to the clear filtrate and with murexide indicator titrated with complexion to a violet color.

For instance, the standard glycol method gave 0.86 percent free CaO, whereas the complexion method gave 0.74 percent and by means of precipitation with oxalic acid followed by permanganate titration, 0.73 percent was found.

Many hours of time may be saved with these methods.

Zement-Kalk-Gips, Vol. 7, No. 6, p. 249 (1954)

Titration of Silicic Acid In Cement

FOR TITRATION OF SILICIC ACID in cement, 0.lg cement is weighed out and suspended in a little hot water. Diluted nitric acid is added and heated to 90 deg. C. After solution is complete, add a few drops of Methyl Red and neutralize with strong carbonate-free alkali. Add an excess of neutral calcium chloride solution and 1 cc. 0.1 percent. Use nitromine solution as indicator and titrate with bariumhydroxide solution until red-brown. The bariumhydroxide is made up to that 1 cc. is equivalent to 10 mg. of SiO_2.

$$Na_2SiO_3 + CaCl_2 + Ba(OH)_2 = BaSiO_3 + Ca(OH)_2 + 2NaCl$$

Good checks can be obtained with the usual Gravimetric method, according to E. Zymny in *Zement-Kalk-Gips* Vol. 8, No. 2, p. 59 (1955).

Gypsum and Gypsum Products Output

DOMESTIC PRODUCTION OF CRUDE GYPSUM for the third quarter of 1955 totaled 2,871,031 short tons, according to a Bureau of Mines report. This was an increase of 20 percent over the third quarter of 1954, which period was a record at that time.

Almost all gypsum products were produced in record quantities with the following percentage gains compared with the third quarter of 1954: sanded and premixed perlite plasters, 45 percent higher; formboard, 29 percent; roof-deck plasters, 25 percent; wallboard, 15 percent; and gypsum lath, 11 percent higher. All industrial plasters were manufactured in greater quantities than in the third quarter of 1954. Sales of gypsum portland cement retarder increased 4 percent during the quarter and 8 percent for the first nine months of 1955. Agricultural gypsum production declined 11 percent in the third quarter of 1955, but cumulative totals show an overall increase of approximately 11 percent for the year.

Perlite Production

THE RAPIDLY-GROWING PERLITE INDUSTRY passed another major milestone in 1955, when expanded perlite replaced sand as the most widely used plaster aggregate in the United States, according to estimates by the Perlite Institute. Expanded perlite production rose to an all-time high of about 220,000 short tons in 1955, with an estimated value of $11,660,000. In 1954, the Bureau of Mines reported a total of 195,499 tons valued at $10,278,745. Almost 80 percent of the expanded perlite produced is consumed by the plastering industry. Approximately 40 percent of all plaster applied in the United States in 1955 was expanded perlite aggregate, as reported by the Perlite Institute. Additional quantities of perlite were used in the production of specially formulated acoustical plasters.

Consumption of perlite as an aggregate in insulating concrete and as a filter aid showed marked increases. The Perlite Institute estimates that about 24,000 tons of perlite were used used in concrete in 1955, enough to place a 2-in. thickness of insulating concrete over 86 million ft. of roof or floor area.

A total of 280,000 short tons of crude perlite were mined and marketed in 1955, with an estimated value of $2,280,000. This is an increase of about 27 percent over the 1954 production of 219,703 tons of crude perlite reported by the Bureau of Mines.

Perlite sales in 1956 are expected to increase between 12 and 15 percent. There are presently, 81 perlite processing plants operated by 72 companies in 31 states. Perlite mines are operated by 13 companies in six western states.

Partner Retires

GUSTAV A. MUCKE has retired as a partner in the Monterey Sand Co., Monterey, Calif.

How Bucyrus-Erie Operating Control Boosts Hole Production

This Bucyrus-Erie 50-R, drilling 9⅞-in. holes in a California limestone quarry, saved 19 cents per foot of hole drilled during a four-month comparison period with other drilling equipment.

Flexibility in Feed and Rotation

Ability to drill any formation efficiently is provided by this Bucyrus-Erie exclusive combination of features: Ward Leonard electric control of drill rotation speed and hydraulic motor control of pulldown. Through Ward Leonard control, the operator can choose the most efficient speed for a given formation — can accelerate or decelerate as required without stopping the drilling operation. In hard formations, maximum pulldown may be exerted on the bit while the drill pipe is turning slowly. In soft material, rotating speed can be increased substantially as down pressure is automatically reduced.

Spectacular footage records set by Bucyrus-Erie rotaries have made them the world's most talked about blast hole drills. Since their introduction to pits and quarries a few years ago, they have established new standards of efficiency and production. One reason why they maintain a steady pace — hole after hole, move after move — is that Bucyrus-Erie design puts every drilling operation under practically push-button control.

Quick Tool Changing

A remote-controlled, power driven tool handling unit moves drill pipes from storage rack to the drill hole. Pipe sections may be added as needed without any heavy manual effort. The complete length of each section may be drilled down in one continuous run, because both rotary drive and pulldown force are applied at top of the drill pipe. After completion of each hole, the drill pipes are withdrawn, dismantled, and stored away, all under power.

Let us tell you more about the rotary blast hole drills that can cut your drilling costs. Bucyrus-Erie Model 50-R drills 9⅞- to 12¼-in. holes, is offered with electric drive. Model 40-R drills 6¾- to 9-in. holes, is available with either diesel-electric or full electric power. Write for detailed specifications and illustrated literature. 29B55C

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South Milwaukee
Wisconsin

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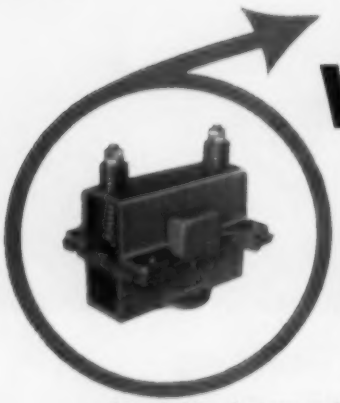

Keep Bulk Materials "On the Move"

. . . through bins, hoppers and chutes with 3600 controllable, electromagnetic vibrations per minute. Syntron Vibrators eliminate arching or plugging of the most stubborn bulk materials. Compact, easy to install, no mechanical wearing parts—eliminate equipment damage from rodding, poking and sledging. Available in models and sizes for any bulk handling installation.

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GASOLINE HAMMER ROCK DRILL

SYNTRON COMPANY

450 Lexington Avenue Homer City, Penna.

SAFETY

(Continued from page 110)

the way men react to their commands. They can also see the safe workers and those that are unsafe. It is the duty of every foreman to protect his men in spite of themselves. A good foreman is aware of these things and governs himself accordingly. Give your foreman "the word" occasionally through foremen's meetings, etc., and he can and will go all out to make a safe and productive crew.

General Manager

ROBERT H. TAGGART has been appointed general manager of the B. Mifflin Hood Co., Chattanooga, Tenn., to succeed Hayden P. Grant, who has resigned to engage in business for himself, having purchased an interest in the Standard Tile Co., tile contractors of Chattanooga, Tenn. Mr. Taggart was formerly general manager of the Key-James Brick Co.

On Board of Directors

HILLMAN LUEDDEMANN has been appointed a member of the board of directors of the Oregon Portland Cement Co., Portland, Ore. He is vice-president of Pope & Talbott, Inc., lumber manufacturer and shipping operator in the Northwest, and past-president of the Portland Chamber of Commerce.

Vice-President of Sales

PURD B. WRIGHT, vice-president and general sales manager, Ash Grove Lime and Portland Cement Co., Kansas City, Mo., has been elected vice-president in charge of sales and advertising, according to an announcement by A. B. Sunderland, president.

Sales Manager Retires

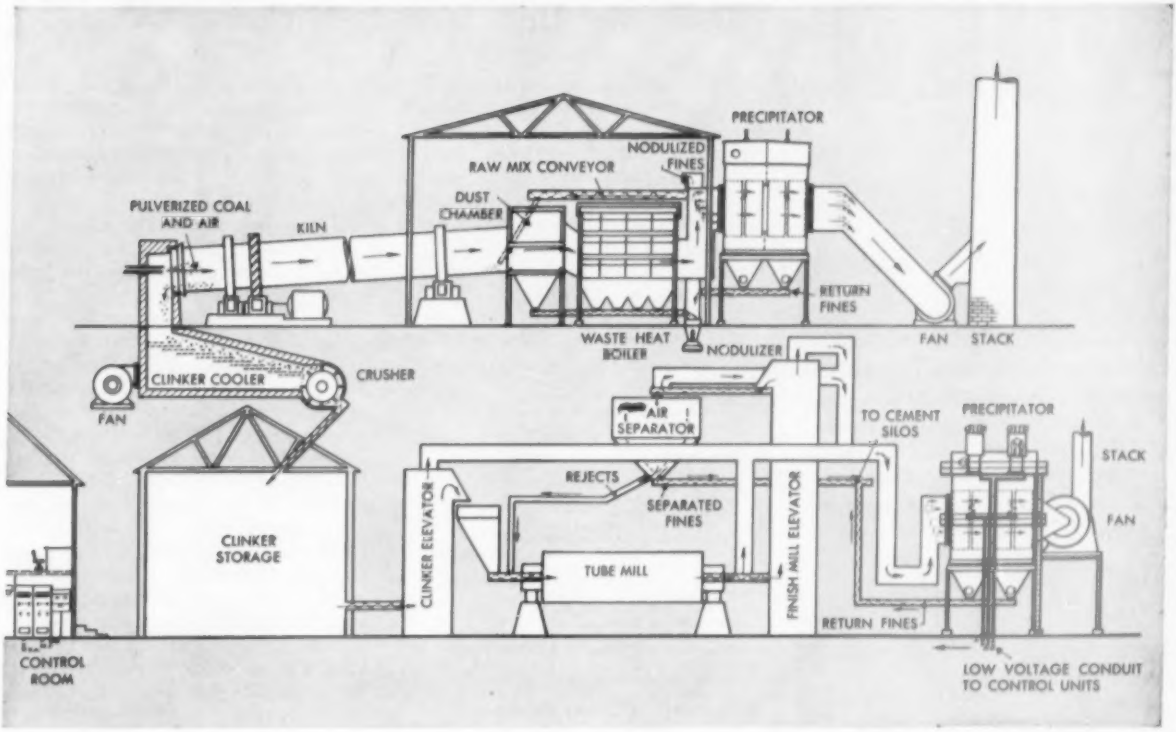
P. G. HAHN, district sales manager at the Spokane, Wash., office of Lehigh Portland Cement Co., Allentown, Penn., has retired after 34 years of service, and will be succeeded by L. R. Snider.

Named a Director

JOSEPH M. BREEN, president and general manager of Canada Cement Co., Ltd., Montreal, Canada, has been appointed a director of du Pont of Canada Securities, Ltd., and its operating company, du Pont Co. of Canada, Ltd.

Industrial Relations

FRANK N. PRICE has been placed in charge of the new department of industrial relations of Ideal Cement Co., Denver, Colo., in a move to centralize all records and functions on employe relations.



How dust collecting problems are handled in the modern cement plant

The "why" of the Cottrell precipitator is well known to cement plant personnel—its use in nuisance abatement and cement dust salvage is well established. These diagrams explain the "how" of the Cottrell, including its familiar application to kiln gas and, more recently, its use in the ventilating system of the finishing mill.

Kiln Gas

The upper half of the drawing shows a Cottrell for cleaning kiln gases. They are first passed through a dust chamber to the waste heat boiler and from there to the electrical precipitator, where the dust is removed. Salvaged dust is returned by conveyor to the process. The cleaned gas is discharged to the atmosphere through an induced draft fan and the stack. (Wet process kilns may also be fitted with Cottrells).

And In The Finish Mill

Dust from the grinding mills has always been a major problem. The lower half of the diagram shows the recent application of the Cottrell for cleaning finish mill ventilating system gases. Cement dust is collected from the ventilating system serving the separators, conveyors and elevators. As before, recovered dust is returned to the process.

Separating Small From Large Particles

When large particles of low alkali content must be separated from very small particles of high alkali content, an integrated mechanical-electrical precipitator will do the job effectively. The mechanical element handles large particles, and the electrical element collects the smaller particles that escape it.

Rapping Puffs Eliminated

With Research-Cottrell's electronically controlled Magnetic Impulse Rappers, there is no need for rapping shutdown periods or dampers. Automatically controlled and operated, the MI Rappers continuously rap the electrodes throughout precipitator operation, thus avoiding dust re-entrainment in the gas stream and assuring optimum precipitator performance at all times.

Many Design Advances

The MI Rapper is one example of many improvements that have taken place in the design of precipitators and their associated electrical equipment. Forty years of experience have provided Research-Cottrell with a rich store of engineering skill—it is this skill that has evolved the modern Cottrell precipitator, embodying a design based on knowledge gained through more than 2000 precipitators in many different fields. Fourteen of these have been installed or are under construction for cement plants. All of these precipitators were custom-engineered to individual specifications.

For a more complete description of the Cottrell precipitator, write to Research-Cottrell for Bulletin GB.

RESEARCH-COTTRELL, INC.

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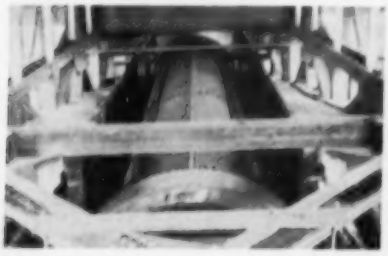
BUCKET LADDER AND HYDRAULIC DREDGES for dredging placer properties, harbor and levee construction, channel changes, production of sand and gravel. Hydraulic dredges from 6-inches up; bucket sizes: 2½ to 18 cu. ft., or larger. Digging depths below water as required.



ABRASION RESISTING STEEL SCREENS —flat or revolving for separating, scrubbing, sizing. Holes taper drilled to prevent clogging. All thicknesses from 3/16" up; other dimensions as needed. Abrasion resisting steel plates available from stock.

DOUBLE-DRUM HOIST, 1,000-ton capacity, built to handle 194-foot digging ladder, typifies heavy equipment Yuba can build for you.

For estimates, send us your drawings or specifications. No obligation.

94

YUBA DREDGES — PROVED EQUIPMENT

YUBA MANUFACTURING CO.

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Eliminating Dust from Kiln Gases

(Continued from page 70)

tained by means of a high velocity jet of clean air applied to the clean side of the belt that blows the dust out of the pores and off the upstream side of the felt. The dust-laden gas is introduced at the top of the cylinder that forms the filter element, and that portion that flows down to pass through the lower portions of the element aids in carrying the collected dust to the hopper.

The following data was obtained during normal plant operation:

Gas volume at inlet conditions
28,000 to 31,000 c.f.m.
Temperature
125 to 180 deg. F.
Dew point
98 deg. F.
Filter ratio (c.f.m. per sq. ft.)
8.5-1 to 9.3-1
Percent reverse-jet operation
40 percent (approximate)
Pressure drop across Multiclone
2.2 in. to 2.7 in. vertical water column
Pressure drop across Dualaire
3 in. to 4 in. vertical water column
Inlet dust load to Multiclone
8 to 16 grains per cu. ft.
Dust load to Dualaire
1.4 to 1.8 grains per cu. ft.
Total dust collection in Multiclone and Dualaire (average)
3030 lb. per hr.

Adaptable to Other Plants

Adaptation of this equipment to other bituminous mix plants has become possible as a result of a parallel development in filter materials. A synthetic felt has been made available for use in this type of equipment that will withstand 270 deg. F. Since these plants are shut down frequently during the day, some provision must be made to avoid the difficulties that would be caused by the gas temperatures falling below the dew point on conventionally operated plants. It has been proposed that a small burner or the existing burner be operated at reduced capacity to maintain the system temperature above the dew point during the temporary shutdowns. This would have the dual purpose of assuring dry filter elements and would eliminate the need to vent dust-laden gas to atmosphere during the preheat period that would otherwise precede a start-up of the bituminous mix plant.

With experience gained on this installation, it is now possible to adapt portions of the system used on this job to plants that operate in the more usual manner with the kiln being fed wet stone and sand and where the dew point of the gas is in the 150 to 160 deg. F. range. Normally the temperature of the gas reaching the kiln on such a plant varies from 200 deg. F. to 325 deg. F. For those plants where the temperature at the point at which it would reach a Dualaire was under 270 deg. F., no air dilution would be required. This permits elimination of the air dilution system and then the Dualaire collector can be sized for the actual gas volume without allowance for added dilution air. The Multiclone would be included or not, depending on the dust load of the particular plant.

If low dust loads existed, the Multiclone and the auxiliary scrubber would no longer be required. The dampers and over-temperature control system would still be used, but, since the gas would be vented to atmosphere during emergency conditions rather than to an auxiliary collector, a simpler dampering system can be used. For those plants where the temperature at the point at which it would reach a Dualaire was over 270 deg. F., it would still be necessary to retain the air dilution system.

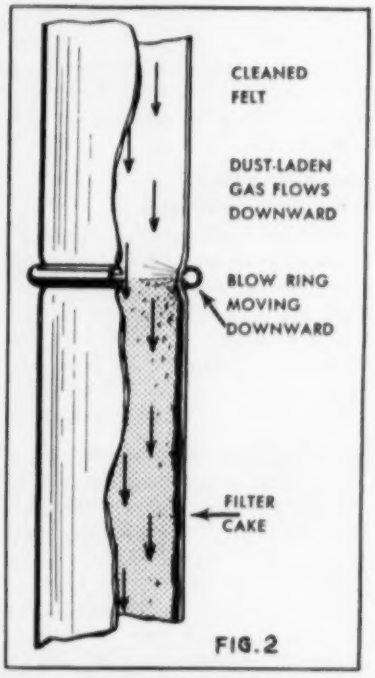

Fig. 2: Illustrates how one of the fabric filter elements functions to remove dust

Sues for Tax Refund

WAGNER QUARRIES CO., Sandusky, Ohio, is suing the federal government for a refund of $91,589 on income tax it paid in 1951. The company contends it should have received a 15 percent depreciation allowance on the tax it paid on sales of $1,451,309 that year, because its products were "of metallurgical or chemical grade." The Bureau of Internal Revenue had ruled that the end use of the firm's products did not justify the allowance, and instead granted varying allowances ranging from 5 to 15 percent.

Longer Lasting!

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WOVEN WIRE SCREEN

"Super-Loy" screens have much greater resistance to wear—cut replacement, downtime and maintenance costs—retain their accurate openings—lower your cost-per-ton!

Immediate Shipment From Stock
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. . . is at your command to help you direct the right woven wire screen or cloth to do your specific job best.

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DODGE PRODUCTS You Should Know-

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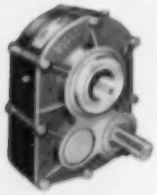
DRIVES & COUPLINGS



TORQUE-ARM
SPEED REDUCERS

DODGE-TIMKEN
PILLOW BLOCKS

Dodge Bulletins you should have-

- Flexidyne Dry Fluid Drives and Couplings. Complete story and selection data. Bulletin A-640-A.
- Torque-Arm Speed Reducers. Technical data and selection methods on all 14 sizes, 1 to 60 hp. Bulletin A-637.
- Rolling Bearings. Load ratings, dimensions and other data on Dodge-Timken and SC and SCM Ball Bearings. Bulletin A-638.

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DODGE MANUFACTURING CORPORATION
2600 Union Street • Mishawaka, Indiana

A.M.C. Division Chairman

GARNER A. BECKETT, president, Riverside Cement Co., Los Angeles, who is chairman of the Western Division of the American Mining Congress, is taking an active part in developing plans for the 1956 Metal Mining and Industrial Minerals Convention and Exposition of the American Mining Congress, which is to be held at the Shrine Auditorium, Los Angeles, October 1 to 4. Trips to nearby mining and industrial operations are being scheduled and every type of modern equipment used to produce metals and minerals today will be on exhibition.

Stanton Walker Honored

STANTON WALKER, director of engineering, National Sand and Gravel Association and the National Ready Mixed Concrete Association, was presented the Roy W. Crum Award for Distinguished Service by the Highway Research Board of the National Academy of Sciences, National Research Council, at its recent 35th annual meeting in Washington. The citation, which is reproduced here, refers to the many honors which have been bestowed on Mr. Walker during his career. It was awarded in recognition of his outstanding accomplishments in the important fields of concrete and aggregates.

Chairman of Executive Committee

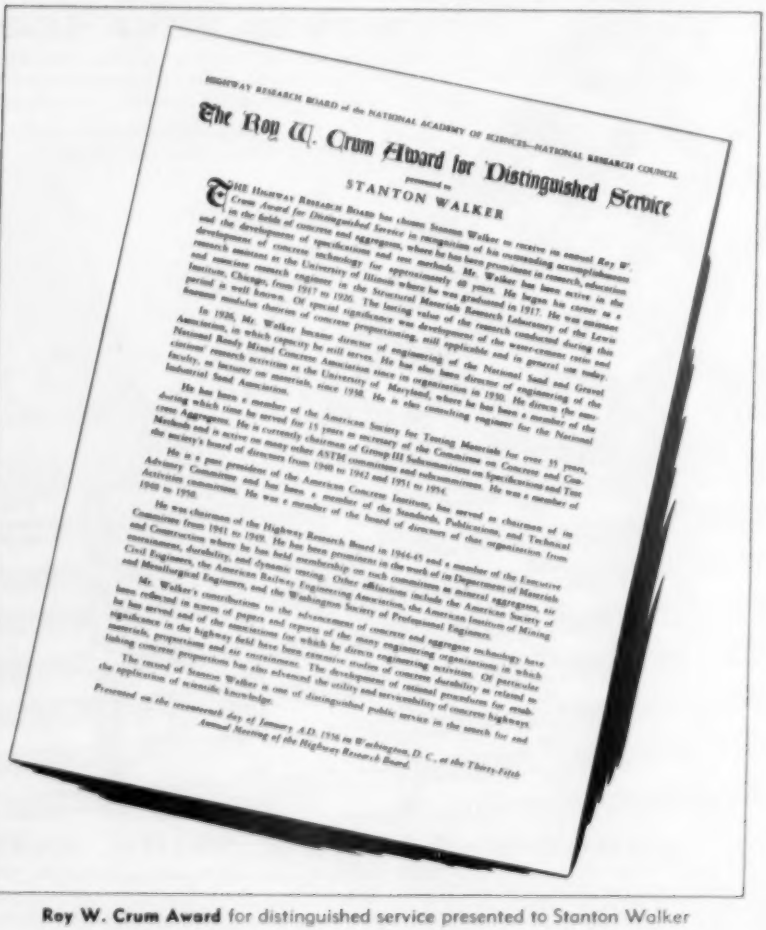
JOHN E. VETTER, traffic manager and assistant sales manager for Superior-Marquette Cement Co., Portsmouth, Ohio, has been appointed chairman of the executive committee of the Ohio Valley Transportation Advisory Board.

P.C.A. Engineer

ARNOLD S. MORSE has been appointed agricultural engineer for the Portland Cement Association in Ohio and West Virginia. He succeeds M. D. Shanklin, who resigned to join the staff of the University of Missouri.

Lone Star Project Manager

R. R. MCBRIDE has been appointed project manager for construction of the new plant of Lone Star Cement Corp. near Lake Charles, Louisiana. He was formerly plant superintendent at Maryneal, Texas.



HIGHWAY RESEARCH BOARD of the NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL

The Roy W. Crum Award for Distinguished Service

presented to

STANTON WALKER

THE HIGHWAY RESEARCH BOARD has chosen Stanton Walker to receive its annual Roy W. Crum Award for Distinguished Service in recognition of his outstanding accomplishments in the fields of concrete and aggregates, where he has been prominent in research, education and the development of specifications and test methods. Mr. Walker has been active in the development of concrete technology for approximately 40 years. He began his career as a research assistant at the University of Illinois where he was graduated in 1917. He was assistant and associate research engineer in the Structural Materials Research Laboratory of the Lewis Institute, Chicago, from 1917 to 1926. The lasting value of the research conducted during this period is well known. Of special significance was development of the water-cement ratio and fineness modulus theories of concrete proportioning, still applicable and in general use today.

In 1926, Mr. Walker became director of engineering of the National Sand and Gravel Association, in which capacity he still serves. He has also been director of engineering of the National Ready Mixed Concrete Association since its organization in 1930. He directs the numerous research activities of the University of Maryland, where he has been a member of the faculty, as lecturer on materials, since 1938. He is also consulting engineer for the National Industrial Sand Association.

He has been a member of the American Society for Testing Materials for over 35 years, during which time he served for 15 years as secretary of the Committee on Concrete and Concrete Aggregates. He is currently chairman of Group III Subcommittees on Specifications and Test Methods and is active on many other ASTM committees and subcommittees. He was a member of the society's board of directors from 1940 to 1942 and 1951 to 1954.

He is a past president of the American Concrete Institute, has served as chairman of its Advisory Committee and has been a member of the Standards, Publications, and Technical Activities committees. He was a member of the board of directors of that organization from 1940 to 1950.

He was chairman of the Highway Research Board in 1944-45 and a member of the Executive Committee from 1941 to 1946. He has been prominent in the work of its Department of Materials and Construction where he has held membership on such committees as mineral aggregates, air entrainment, durability, and dynamic testing. Other affiliations include the American Society of Civil Engineers, the American Railway Engineering Association, the American Institute of Mining and Metallurgical Engineers, and the Washington Society of Professional Engineers.

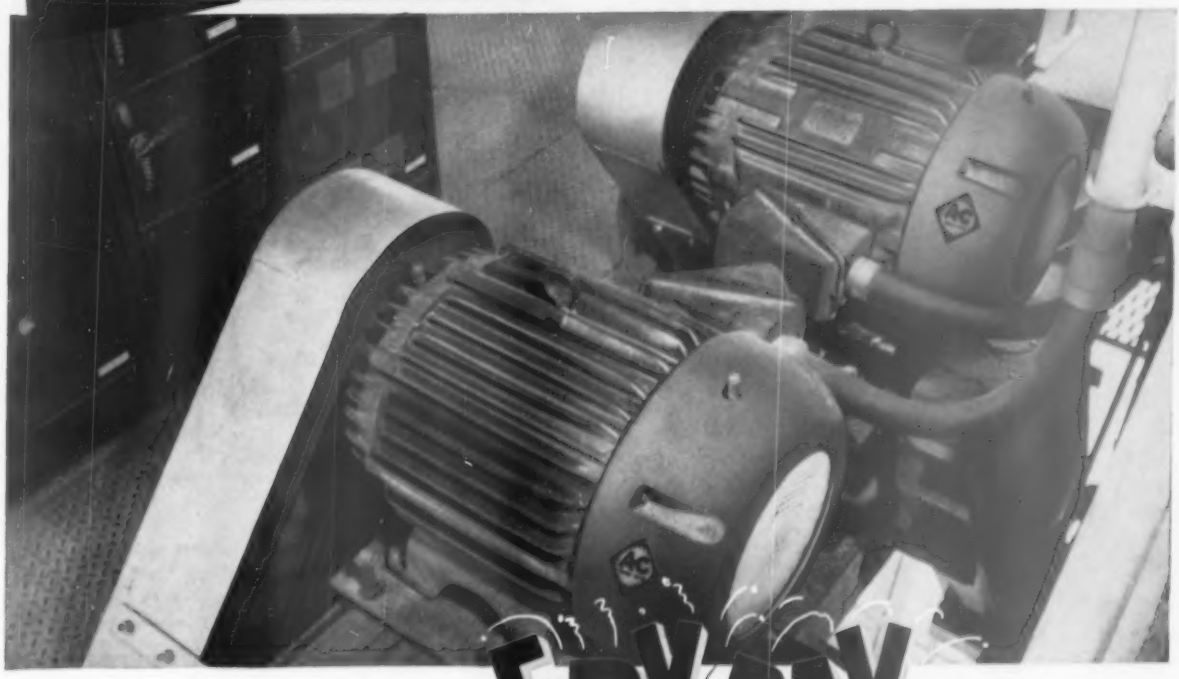
Mr. Walker's contributions to the advancement of concrete and aggregate technology have been reflected in terms of papers and reports of the many engineering organizations in which he has served and of the associations for which he directs engineering activities. Of particular significance in the highway field have been extensive studies of concrete durability as related to materials, proportions and air entrainment. The development of concrete durability as related to batching concrete proportions has also advanced the utility and serviceability of concrete highways.

The record of Stanton Walker is one of distinguished public service in the search for and the application of scientific knowledge.

Presented on the seventeenth day of January A.D. 1956 in Washington, D. C., at the Thirty-Fifth Annual Meeting of the Highway Research Board.

Roy W. Crum Award for distinguished service presented to Stanton Walker

There's **MORE** Cooling Surface in these deep-ribbed **MOTORS**



No Day is FRYDAY

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● Frying of insulation is impossible under normal conditions with the extra-large cooling surface of Allis-Chalmers rib-type TEFC motors. The result—you expect and get longer motor life.

The engineered partner of A-C motors is Allis-Chalmers control.

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As a new machinery component or as replacement, specify Allis-Chalmers. Discuss your particular application with your nearby A-C distributor, A-C district office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

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Is This the PIPE You're Looking For?

When you need lines for mining and quarrying operations, consider the basic advantages of Naylor Spiralweld pipe in both high and low pressure air and water service.

From a structural standpoint, the Naylor spiral truss provides extra strength and safety for mining operations. The same structure adds collapse strength when Naylor pipe is used in vacuum service on ventilating lines. Here, too, the lockseamed, spiralwelded structure permits use of lighter gauge material for lower cost without sacrificing performance.

For installation ease and economy, the one-piece Naylor Wedge-Lock Coupling will connect lines better than by any other method.

Sizes range from 4" to 30" in diameter with lengths to 40 feet.

Write for Bulletins No. 507 and No. 513.

NAYLOR PIPE

NAYLOR PIPE COMPANY

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Eastern U. S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York

ROCKY'S NOTES

(Continued from page 17)

land cement raw mixes always contain much more lime than necessary to convert all the silica to 2 CaO · SiO_2, there is no chance of the MgO combining with SiO_2 or in sufficient quantity with any other of the oxides present to eliminate periclase. This is not true of blast-furnace slags; consequently it is only rarely that they contain uncombined MgO or periclase.

In discussing the paper of Dr. Keil, a representative of the Council for Scientific and Industrial Research, South Africa, Dr. N. Stutterheim, said in respect to high magnesia slags: "The author quotes Nurse and the writer as concluding that beyond a certain content, MgO is not hydraulically effective because it crystallizes as spinel (MgO · Al_2O_3). In this connection it may be said that the effect is indirect; viz, it is the removal of the hydraulically active Al_2O_3 to form insoluble spinel that would bring about a reduction in the cementing action. However, even if such spinel formation is inhibited by sufficiently rapid chilling it is found that MgO cannot be regarded as equivalent to CaO, probably because it does not form cementitious hydrates to anything like the same extent as CaO.

"Further work done by the writer at the South African Building Research Institute in connection with the possibility of making cement from high magnesia slags has shown that for this type of material the magnesia content would have to be in excess of 24 percent before there would be any risk of periclase formation. Spinel (MgO · Al_2O_3) is the primary phase for these slags if they are basic; for slags with higher SiO_2 contents the primary phase is forsterite. The actual blast-furnace slags concerned have MgO contents of the order of 19-22 percent and give negligible autoclave expansions and show no signs of unsoundness."

It was brought out in Dr. Keil's paper and in the discussions of it, that hydraulicity of the slag itself is not necessarily an accurate measure of the results that may be expected when used with any particular cement. It is really a favorable combination result that is desired, and this would very likely vary both with the slag and with the cement. That is, one slag might react more effectively with one cement than another. This is to be expected since cements vary in both lime and alkali content, and these are the activating agents for the slags. Also, of course, there exists an infinite variety of proportions of the two, even when both a particular slag and a par-

(Continued on page 124)

from Asbestos to Zinc...

ASBESTOS	IRON ORE	SILVER
ANTIMONY	LEAD	SLAG
CEMENT	LIMESTONE	TACONITE
CHROMIUM	MANGANESE	TIN
COPPER	MOLYBDENUM	TITANIUM
DOLOMITE	NICKEL	TUNGSTEN
FELDSPAR	NITRATE	URANIUM
GOLD	POTASH	VANADIUM
GRAVEL	REFRACTORIES	ZINC

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are the leading choice for large volume production of finely crushed material at low cost

In all of the great ore and industrial mineral operations throughout the world, ranging from Asbestos on through Zinc, Symons Cone Crushers have consistently aided man by making possible the efficient reduction of these materials to meet growing demands.

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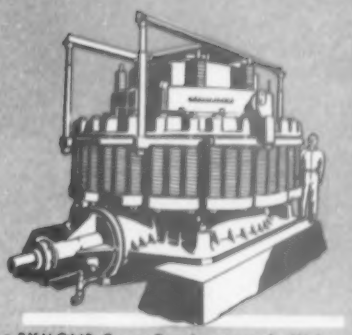
Whenever *you* are confronted with high capacity fine reduction crushing problems, it will pay you to investigate the advantages of Symons Cone Crushers . . . *the machines that revolutionized crushing practice.*

Nordberg Mfg. Co., Milwaukee, Wis.



• SYMONS Cone Crushers are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to over 900 tons per hour.

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MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

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Grinding Mills

Mine Hoists

Vibrating Bar Grizzlies

Diesel Engines

AKINS...FIRST IN EXPERIENCE

used since 1908 for efficient, low-cost classification

TYPICAL CASE HISTORY

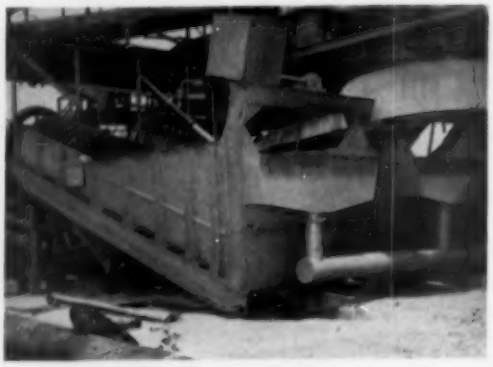
Pioneering in Phosphate

In cooperation with the phosphate mining companies, Colorado Iron Works engineers applied their specialized classification experience in helping to solve the problems associated with developing efficient treatment of phosphate ores. Akins dewatering, deoiling and desliming classifiers were among the first used in this field. Having proved their efficiency Akins Classifiers predominate the phosphate field.

1944

...2 Akins for Swift and Company's Watson Mine, one of first classifier installations on phosphate.

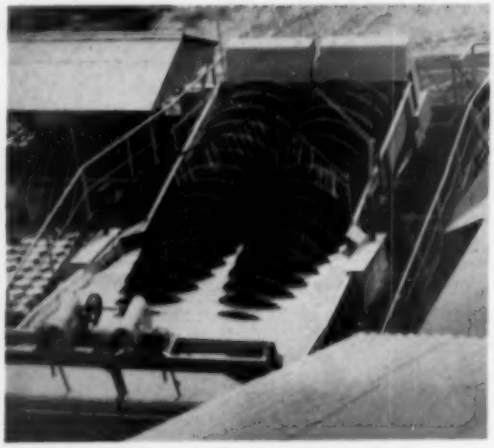
These 2—54" Akins Simplex Classifiers, installed in 1944, and 2 others purchased later, are dewatering and desliming +150, —35 mesh flotation feed.



1956

...8 Akins at Armour Fertilizer Works' New Plant, Bartow, Florida.

This recent installation includes 1—78" Duplex Akins, 1—66" Duplex Akins, 1—60" Duplex Akins, 1—66" Simplex Akins, and 4—60" Simplex Akins. They are being used for dewatering flotation feed, flotation concentrate, belt feed, belt concentrate, and for primary and secondary deoiling.



There are now 28 Akins operating successfully in 8 phosphate plants

AKINS...the Original Spiral Classifier*

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COLORADO IRON WORKS CO.

A SUBSIDIARY OF THE MINE AND SMELTER SUPPLY CO.

DENVER, COLORADO

SPECIALISTS IN CLASSIFICATION FOR 48 YEARS

ticular cement have fair uniformity.

Just as in the case of portland-pozzolan cements there thus exists a wide field for individual plant research to find the best combination of the available materials. It isn't popular to say so, but the same truth holds in the manufacture of portland cements generally. They can never be made strictly uniform from one plant to another, and some of the effort expended to make them so could probably be as profitably spent in trying to make a product best suited to the raw materials available in each case.

A.S.T.M. Senior Secretaries

J. W. CAUM and L. C. Gilbert, formerly assistant technical secretaries, have been appointed senior assistant technical secretaries of the American Society for Testing Materials, Philadelphia, Penn. Both have been members of the A.S.T.M. staff since 1946. Mr. Caum, a metallurgist and a graduate of Pennsylvania State University, has been working with committees in the field of ferrous and non-ferrous metals, and Mr. Gilbert, a civil engineer and a graduate of the University of Cincinnati, has been serving with committees on ceramics, cement and concrete.

Manager of Sales

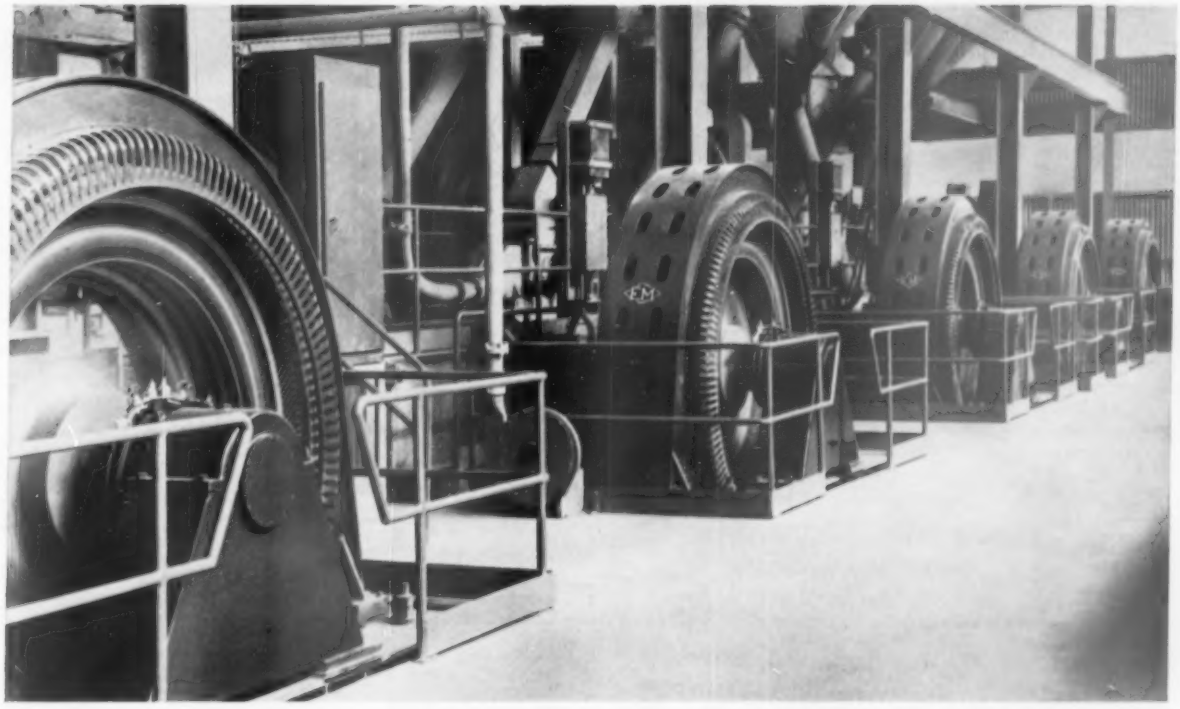
CHARLES C. JORDAN, formerly regional engineer of asbestone sales, has been appointed manager of corrugated asbestone sales, New Orleans, La., of National Gypsum Co., Buffalo, N. Y. He succeeds the late Donald A. Rosensteele. Mr. Jordan joined the company's Bluebonnet ordnance plant, McGregor, Texas, in 1942. Upon his return from service in the U. S. Army Air Force, he was appointed an engineer of plant construction and administrative assistant for the engineering department.

Engineering Manager

DR. RAYMOND WYNKOOP has been appointed manager of the general engineering department of the engineering division of International Minerals and Chemical Corp., Chicago, Ill. He was formerly a senior member of the planning and engineering staff for National Distillers Products Corp.

District Engineer

VAUGHN MARKER, asphalt paving specialist with the California Division of Highways, has joined The Asphalt Institute field forces as district engineer for the California coastal counties. He will work directly under the supervision of B. A. Vallerga, Pacific Coast managing engineer.



Notable for advancements in safety and simplicity is the new grinding mill department of Dragon Cement Company, Northampton, Pa. An excellent example of compactness, it is designed to be safely operated by four men. Rated capacity will be 2,400,000 bbl. of cement annually.

How Dragon Cement Company drives mills efficiently and safely in new 4-man grinding mill department

E-M "INCHER" CONTROL

This E-M-developed control provides quick, safe spotting of grinding mills. It turns mills literally inch-by-inch into desired position, all at the touch of a button. One E-M "Incher" Control can serve several motors, saving time and greatly increasing safety.

● Helping to achieve labor conservation, simplified maintenance, and safety in this new raw and finish grinding mill are five rugged E-M Synchronous Motors rated 1000 hp, 180 rpm, 2300 volts, "unity" power factor. Specifically, here's how these E-M Motors contribute to new standards of economical plant operation:

1. **HIGH EFFICIENCY** conversion of electric power to mechanical power, resulting in minimum electric power cost for operation of mills.
2. **POWER FACTOR CORRECTION** with "unity" power factor helps keep overall plant power factor high, further reducing power costs.
3. **DIRECT CONNECTION** of Motors to mills, thru rigid couplings for simplicity and minimum installation space.
4. **HEAVY-DUTY MILL-TYPE CONSTRUCTION**, including extra-heavy motor frame, high thermal capacity cage windings, dust resistant coil finish, and cool running sleeve-type bearings.

When you combine such motor features and top performance with E-M Hi-Fuse (high voltage, high interrupting capacity) Controls, you get the ultimate in protection as well. Complete safety for personnel and equipment, plus *extra safeguards* against short circuits and abnormal operating conditions. Your nearest E-M sales engineer can give you facts and data. Write the factory for E-M Publication No. 175 on large synchronous motors.

ELECTRIC MACHINERY MFG. COMPANY
MINNEAPOLIS 13, MINNESOTA

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Specialists in making motors do **EXACTLY WHAT YOU WANT THEM TO**

why gamble
on point performance?

insist on ESCO

TESTED POINTS

for... DRAGLINES
DIPPERS
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Self-Sharpening *ESCO* Points are *individually Brinell tested* to be sure they have exactly the correct degree of abrasion resisting hardness for faster digging and longer life.

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MANUFACTURERS NEWS

Easton Car & Construction Co., Easton, Penn., announces the election of George D. Fraunfelder, director of engineering and research, as vice-president of engineering. Mr.

U. M. Johnson

George D. Fraunfelder

Fraunfelder joined Easton in 1914 as a salesman and advanced to sales engineer in New York, design engineer, manager of quarry and mine department, and chief sales engineer. He has been director of engineering and research since 1948. U. M. Johnson, project engineer, has been appointed vice-president of industrial sales. He joined Easton in 1945 as assistant superintendent.

Worthington Corp., New York, N.Y., has announced the election of Elston J. Tribble and Aloysius M. Tullo as vice-president. Mr. Tribble, former assistant vice-president of manufacturing, has general supervision of a group of operating divisions recently organized under a decentralization program. Mr. Tullo will continue as general manager of the division at Harrison, N. J.

Pettibone Mulliken Corp., Chicago, Ill., announces the appointment of Wade Meloan as a vice-president. He was formerly treasurer and will be succeeded in this position by Lawrence E. Denman, assistant treasurer.

Sauerman Bros., Inc., Chicago, Ill., announces the retirement of Louis E. Dierks as a vice-president and a member of the board of directors after 42 years of service. A life member of the American Society of Civil Engineers and the Chicago Engineers Club, Mr. Dierks is well known in the construction and sand and gravel industries. He will remain with the company as a consultant.

Taylor-Wharton Division, Harrisburg Steel Corp., High Bridge, N. J., has appointed W. E. Viggers as New York district sales manager of manganese and alloy steel castings. He was formerly with Penn Steel Casting Co., Chester, Penn.

Fuller Co., Catasauqua, Penn., has announced the appointment of Jobe & Co., Baltimore, Md., as sales representative in the Baltimore, Washington and Richmond areas.

Chain Belt Co., Milwaukee, Wis., has announced the promotion of W. B. Marshall from sales promotion manager to manager of market development and sales training. G. H. Pfeifer, formerly advertising manager, has been appointed manager of sales promotion and advertising for all five divisions of the company. Mr. Marshall joined Chain Belt in 1920 as a student engineer. Mr. Pfeifer has been with the firm since 1933.

W. B. Marshall

G. H. Pfeifer

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IN EVERYTHING RELATING TO DIAMOND CORE DRILLING AND SOIL SAMPLING

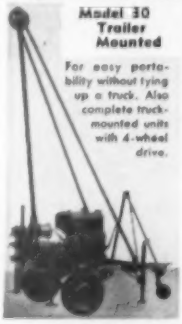
FOR QUICK ACTION CALL DIAMOND 4-8507 AT SCRANTON

"ORIENTED" DIAMOND BITS CUT FASTER — LAST LONGER

For either core drilling or any other type of diamond drilling, we believe these to be the most efficient and economical diamond bits ever produced and invite inquiries on that basis. Available at no advance in price in a wide variety of types and sizes to meet every diamond drilling requirement. Bulletin No. 320 illustrates all types and gives complete working data. Write for free copy and tell us about your drilling conditions. We welcome opportunities to make money-saving recommendations.

NEW LIGHT-WEIGHT HIGH-SPEED CORE-DRILLING MACHINES Model 30 and Model L-2

Supplementing our well-known line of heavy-duty machines for large-diameter and deep-hole drilling we now offer two light-weight high-speed-core drilling machines suitable for either Skid, Trailer or Truck mounting. Both models can be powered by either gasoline or diesel engines and air or electric motors. Easily moved from one location to another, they can also be relied upon to produce good smooth cores rapidly at minimum expense. Complete illustrated information furnished on request.



Model 30 Trailer Mounted

For easy portability without tying up a truck. Also complete truck-mounted units with 4-wheel drive.

ACCESSORY EQUIPMENT STOCKED FOR PROMPT SHIPMENT

We manufacture a wide variety of accessory equipment for diamond drilling and soil sampling and carry all essential items in stock for prompt delivery. A NEW CATALOG, No. 400, not only illustrates and describes each item but also gives piece numbers and shipping weights. Write to day for a free copy; it will help you to save time and money.

CONTRACT DRILLING

For more than seventy years, Sprague & Henwood, Inc. has been a leader in the field of Contract Diamond Drilling and Soil Sampling. During this long period of time our crews have completed thousands of contracts successfully, under every conceivable operating condition. Today, we have a large force of expert operators and an ample supply of modern equipment, so that we can undertake practically any job anywhere, on short notice. Inquiries for all types of contract drilling work are solicited — estimates submitted promptly without charge or obligation.

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How you can protect costly crushing machinery from tramp metal damage and prevent downtime from eating into profits is explained with concise text and pictures in this helpful folder. You'll discover an easy way to gain automatic protection from stray metal parts and scrap—both magnetic and non-magnetic—you'll see how easy it is to install and operate RCA equipment. Mail coupon below for your free copy.

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720 TONS . . . AN HOUR'S HAUL WITH THIS SAUERMAN TOWER EXCAVATOR

Pioneer's giant excavator is the largest power scraper installation in the sand and gravel industry.

Pioneer Sand and Gravel Co., Seattle, Wash., needs a huge flow of material to supply its ready-mix plants and barges. They're getting it with a 12-cu. yd. Crescent Scraper.

The Crescent handles 480 yds. or 720 tons per hr. over an average haul from 300 to 350 ft. It operates along a 675-ft. span between movable head and tail towers located at the base and top of the 240-ft. high bank.

In addition to high rate of delivery, adoption of the Sauerman Method provides two other advantages over the 5-cu. yd. power shovel that formerly operated off the "toe" of the bank. These are: (1) material can now be taken from anywhere on the bank for blending and selection of gravel, and (2) material can be moved down the slope with no danger of cave-ins.

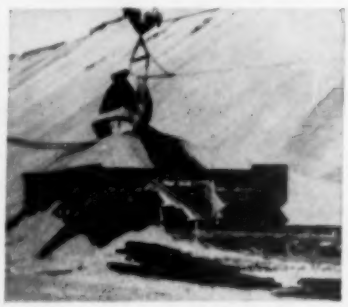
The tower excavator at Pioneer is mounted on portable towers and engineered by Sauerman for economical excavation in this type of deposit. This same digging tool . . . the Crescent scraper . . . can be engineered to your operation to give you equivalent high production at low cost.

Sauerman Scrapers range from ¼ cu. yds. up to 18 cu. yds.

Because in most cases it is cheaper to drag material than it is to lift and transport it, *they give you the lowest cost per cu. yd. handled.*

Contact us for information and specific recommendations. Ask for field reports and Catalog A.

This view gives some conception of the height and steepness of the bank on which the Crescent works.



The Crescent delivers to a portable field hopper from which belt conveyors transport the material to the plant.

SAUERMAN BROS. INC.

630 S. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

Continental Gin Co., Birmingham, Ala., announces that Eugene H. Brooks, formerly vice-president in charge of sales, has been elected executive vice-president, and Glenn P. McCarty, formerly sales manager of the western district, has been named vice-president of the district. Ralph Y. MacIntyre, who has been manager of the industrial division, has been appointed manager of sales development, and George C. Morgan, formerly manager of the special products division, has been placed in charge of the industrial division. R. T. Dorsey, formerly assistant district sales manager of the Memphis office, has been appointed general sales manager of gin machinery; T. L. King, formerly sales engineer, has been named manager of sales engineering; and G. C. Cagle, Jr., formerly assistant sales manager of the western district, has been made sales manager of the district.

Eugene H. Brooks

Ralph Y. MacIntyre

George C. Morgan

Fairbanks, Morse & Co., Chicago, Ill., has announced the appointment of C. G. Gehringer as manager of the scale division. He was formerly assistant manager and succeeds George C. Worthley who has retired after 41 years of service.

Koehring Co., Milwaukee, Wis., has announced the appointment of K. R. Chandler as service manager. He was formerly West Coast district representative and succeeds G. N. Nelson who has retired after 44 years of service.

The Yale & Towne Mfg. Co., Philadelphia, Penn., announces the appointment of Fred E. Rau as assistant hoist sales manager. He was formerly hoist equipment district sales manager in Cleveland, Ohio.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces that Willis G. Scholl has been elected executive vice-president. Boyd S. Oberlink, formerly vice-president and general manager of the construction machinery division, has been named to succeed Mr. Scholl as vice-president in charge of the tractor group. E. J. Mercer, who has been managing director of Allis-Chalmers Great Britain Limited, Essendine, England, has been appointed general manager of the construction machinery division.

Boyd S. Oberlink

Willis G. Scholl

Why brute loads don't "bust" this screen

● Here's a screen built to take abuse . . . a screen specifically designed to handle large quantities of *big, heavy* rock and ore.

The main frame of this powerful PIONEER Mesabi Vibrating Screen is built from 18" car channel or I-beams and reinforced with 8" wide flange cross beams. Screen frames are constructed from extra-heavy channels, pipe, angles, and bars. Pan side thicknesses range from ⅜" to ½", depending on size of screen. Angle bracing at critical points adds further strength and rigidity. Beefed-up shafts are built to take it.

EFFICIENCY. PIONEER Mesabi screens are not only rugged, but you just can't beat them for fast, accurate separation.

That's because PIONEER'S full circle, forward throw agitation produces an identical, positive motion from one end of the pan to the other. Every inch of this screen works for you.

Near-perfect balance is maintained by placing the shaft at the pan's exact gravitational center and counterbalancing the flywheels to offset the throw of the pan. This gives precise end-for-end, top-for-bottom balance at all times. Since vibration is confined to the pan and not transmitted to the frame, less power is needed and equipment lasts longer.

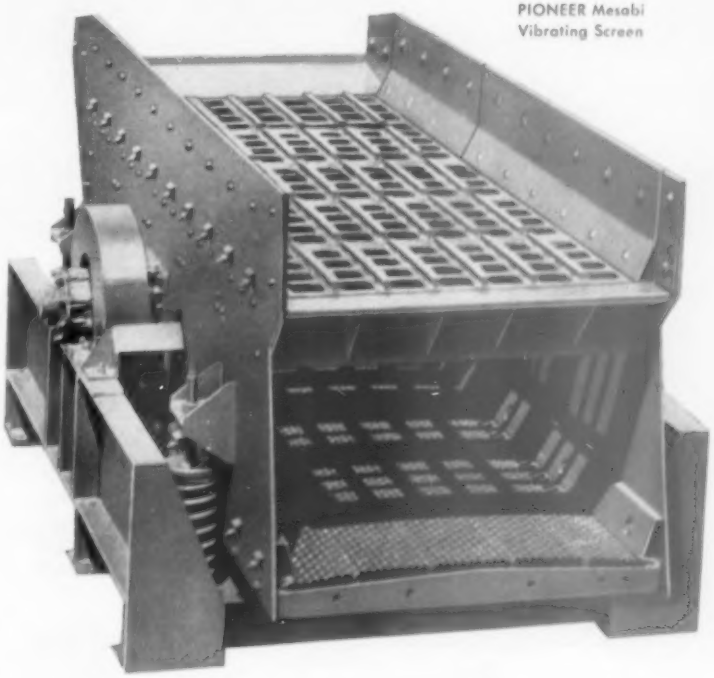
OUTPUT. PIONEER screens are known for their extra capacity. Positive throw, down-hill agitation, and use of the entire screen surface, combine to deliver maximum tonnage.

SPECIFICATIONS

Size	Horse-power	Approximate weight in pounds		
		1 Deck Scalping	2 Deck Scalping	2-Deck Gradation
4'x10'	15	8,900	8,800	8,000
4'x12'	15	10,000	10,000	9,100
5'x10'	20	11,800	11,800	11,000
5'x12'	20	12,800	12,700	12,000
5'x14'	25	13,700	13,600	13,000
6'x12'	30	14,550	14,200	13,800
6'x14'	30	15,800	15,300	14,900

Ask your screen salesman these questions

1. Will frame resist sagging and twisting under heavy loads?
2. Is vibration effectively confined to pan?
3. Do both ends of screen vibrate equally with the middle?
4. How efficient, percentagewise, is separation?



PIONEER Mesabi Vibrating Screen

For detailed features, specifications, and performance data, write Pioneer Engineering Works, Inc., Minneapolis 13, Minnesota, or see your nearest PIONEER Distributor.

BUY BOTH! HIGHER OUTPUT LOWER UPKEEP

Pioneer *Continuflo* EQUIPMENT

Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.
Subsidiary of Poor & Company • Chicago
Please send information on equipment checked.

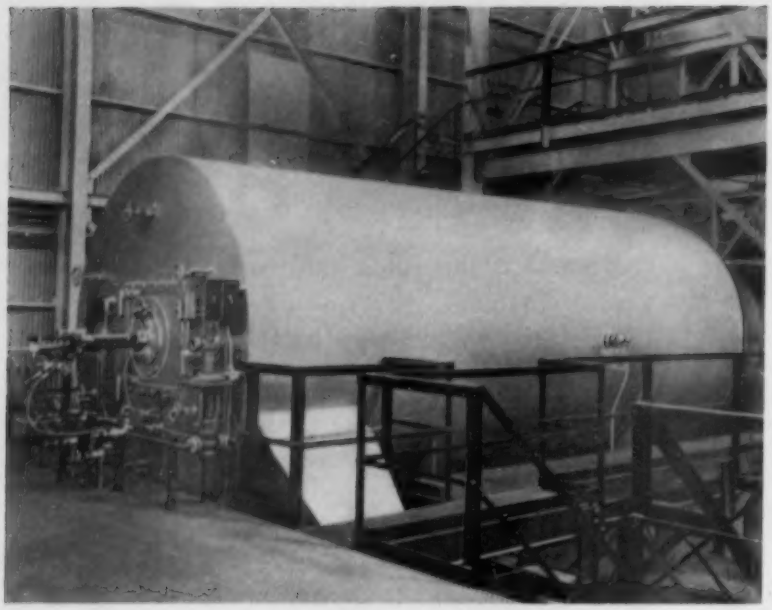
- ☐ GRAVEL PLANTS
- ☐ WASHING PLANTS
- ☐ MECHANICAL FEEDERS
- ☐ ROCK PLANTS
- ☐ BITUMINOUS PLANTS
- ☐ VIBRATING SCREENS
- ☐ JAW CRUSHERS
- ☐ APRON FEEDERS
- ☐ BUTTER SCREENS (LIGHT DUTY)
- ☐ ROLL CRUSHERS
- ☐ GRID FEEDERS
- ☐ CONTINUFLO CONVEYORS

Name _____

Company _____

Address _____

City _____ *Zone* ___ *State* _____

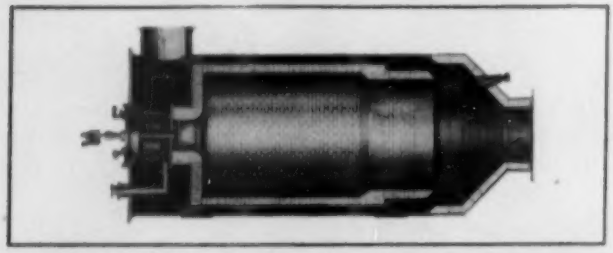


FAST! EFFICIENT!

BIG VOLUME DRYING

WITH PEABODY AIR HEATERS

Fast, efficient, drying of 300 tons of phosphate rock per hour is one of the many instances of the successful use of Peabody Air Heaters in the Rock Products industry. The Peabody heater maintains maximum production levels day after day, while insuring highly efficient and economical operation with minimum outage. Peabody, a leader in the combustion field, furnishes Air Heaters with air cooled cylindrical furnaces for many types of rotary kilns, and also oil and gas burning equipment for firing directly into such kilns. For further details write direct—illustrated bulletin available on request.



Typical Peabody Air Heater installation with an integral Peabody Burner and combustion chamber delivering to a kiln combustion products at 1800-2000°F. for drying phosphate rock for fertilizer. Both furnace and refractory are positively cooled by forced convection, with high velocity air between the shells.

PEABODY ENGINEERING CORPORATION

580 FIFTH AVENUE • NEW YORK 36, N.Y.

Offices in Principal Cities

S-691 *PEABODY LIMITED • LONDON, S.W. 15, ENGLAND*

Thermoid Co., Trenton, N. J., has announced the election of Joseph E. Cox as vice-president of Thermoid Co. and general manager of Essex Rubber Co., a subsidiary.

Detroit Diesel Engine Division, General Motors Corp., Detroit, Mich., has appointed the following distributors: Hubbs Engine Co., Cambridge, Mass., in Massachusetts, Rhode Island, Maine, New Hampshire and part of Connecticut; and the Gil Boers Equipment Co., Chicago, Ill., in northern Illinois and counties of Lake, Porter, LaPorte and St. Joseph in Indiana.

Morris Machine Works, Baldwinsville, N. Y., has named Cross Pump & Equipment Co., Charleston, W. Va., as sales representative in southern West Virginia, eastern Kentucky and western Virginia.

Le Roi Division, Westinghouse Air Brake Co., Milwaukee, Wis., has announced the appointment of William F. Briney as manager of construction industry sales.

American Air Filter Co., Inc., Louisville, Ky., announces that W. G. Frank, formerly executive vice-president, has been elected president of the company to succeed W. M. Reed, who has been named chairman of the board. Ben R. Shaver has been promoted from secretary-treasurer to vice-president and treasurer, and E. G. Mason from assistant secretary-treasurer to secretary.

Hewitt-Robins, Inc., Stamford, Conn., has announced the appointment of Austin Goodyear as executive vice-president. He was formerly vice-president and general manager of the industrial rubber, machinery and engineering divisions.

Marion Power Shovel Co., Marion, Ohio, has announced the appointment of Dean Calland as western sales manager for California, Nevada, Utah and Arizona, with headquarters in San Francisco. He will be assisted by T. R. Fogelberg, Los Angeles, and E. J. Riggs, Phoenix, Ariz., division sales managers.

Raybestos-Manhattan, Inc., Passaic, N. J., has announced the appointment of Austin L. Hawk as manager of the western sales district, Chicago. He has been assistant district manager since 1951.

Hyster Co., Portland, Ore., announces that Ernest G. Swigert, president, has been elected national vice-president of the National Association of Manufacturers. He has served on the board of directors of N.A.M. for a number of years and during 1955 served as regional vice-president.

Jaeger Machine Co., Columbus, Ohio, announces that J. D. Anderson has been appointed general sales manager, succeeding J. H. Yearling who has been named director of market promotion. Mr. Anderson was formerly divisional sales manager and Mr. Yearling has served as sales manager since 1949.

Fruehauf Trailer Co., Detriot, Mich., has announced acquisition of the Hobbs Mfg. Co., Fort Worth, Texas, which will be operated as Fruehauf-Hobbs of Texas, a division of Fruehauf Trailer Co. William E. Grace continues as vice-president and general manager of the Fruehauf-Hobbs division.

Hardinge Co., Inc., Chicago, Ill., has announced the appointment of Ellsworth B. Doelp as district manager of the central territory which includes Illinois, Indiana, Missouri, Arkansas, Oklahoma, Kansas, Nebraska, Iowa and portions of Texas, Wisconsin, Michigan and Kentucky.

Clark Equipment Co., Benton Harbor, Mich., has appointed the following distributors: Sheehan-Bartling, Inc., Sioux Falls, S. D., in South Dakota; and J. W. Burress, Winston-Salem, N. C., in North Carolina.

stop using TWO machines

to do a ONE machine job

HYSTAWAY® combines crane and tractor in ONE machine

Mount a Hystaway on a new **or used** Caterpillar-diesel Tractor and you get a hard-working piece of equipment that allows one operator and one machine to do a job that formerly required two separate machines (crane and tractor.)

With Hystaway one man and one Machine handle all secondary breaking and clean-up. Hystaway, equipped with crane boom and drop ball, mounts easily without alteration on a new or used Caterpillar D6, D7, or D8 Tractor.

Handy for maintenance work—able to travel at tractor speeds, Hystaway also keeps busy on jobs such as lifting screens and motors on crusher repairs, building and maintaining haul roads.

If you are now using two separate machines (crane and tractor) to handle secondary breaking and clean-up, it will pay you to investigate the savings in operating costs made possible by the Hystaway-Tractor combination.

See your Caterpillar-Hyster dealer for details, or write direct to Hyster Company, 2918 N. E. Clackamas Street, Portland, Oregon or 1818 N. Adams Street, Peoria 1, Illinois.

HYSTER COMPANY

"Matched Design" Tractor Tools for Caterpillar-built Tractors

HYSTER

More Tonnage

"Cape Ann"
Forged
Steel Drop Ball

Ruggedly designed and drop tested to insure maximum breakage. Lifting link protected by deep recess to minimize cable replacement. Adaptable for swivel or shackle.

Used by leading quarries for *economical secondary breakage.*

2000 to 12000 lbs.

Prompt Shipments

For further information write—

Cape Ann Anchor & Forge Co.
Post Office Box 360
Gloucester, Mass.

Chase Bag Co., Chicago, Ill., announces that John P. Grady has been named assistant general sales manager. He was formerly eastern regional sales director and will be succeeded by Harrison B. Rue, formerly manager of the Buffalo branch. Tom A. Eadon, Jr., formerly sales representative, has been named sales manager of the Philadelphia branch, and J. T. Cleland, formerly sales representative in the Dallas branch, has been appointed sales manager of the branch. J. A. Sutherlin has been made manager of export sales to succeed N. G. Kappler, who has retired.

Eaton Mfg. Co., Cleveland, Ohio, announces that Robert C. Ochs has been appointed general manager of the axle division. For the past year he has been assistant general manager of the division, serving under Geo. W. Veale, vice-president and general manager, who will continue as vice-president of the company.

Galion Allsteel Body Co., Galion, Ohio, has appointed Maday Body Works, Buffalo, N. Y., as distributor in western New York.

Link-Belt Co., Chicago, Ill., has opened a new district office in Shreveport, La., with Gerald A. Stone as district manager. Territory includes northern Louisiana, southern Arkansas and 14 counties in Texas.

Power Crane and Shovel Association, New York, N. Y., announces election of the following officers and directors: D. W. Lehti, president, Link-Belt Speeder Corp., Cedar Rapids, Iowa, president; M. B. Garber, vice-president of sales, The Thew Shovel Co., Lorain, Ohio, vice-president; and P. H. Birkhead, vice-president, Bucyrus-Erie Co., South Milwaukee, Wis., and C. B. Smythe, president-treasurer, The Thew Shovel Co., Lorain, Ohio, directors.

The Bristol Co., Waterbury, Conn., announces the promotion of Peter B. McSherry, Jr., from assistant sales manager to sales manager of the socket screw division.

Napco Industries, Inc., Detroit, Mich., announces that the Federal Motor Truck division has been moved from Detroit to Minneapolis, Minn. Federal Motor Truck Co. was merged into Napco in March, 1955.

The Gene Olsen Corp., Adrian, Mich., has appointed Vaughn Monsell as sales representative in California, Oregon, Washington, Idaho, Nevada and Arizona.

Euclid Division, General Motors Corp., Cleveland, Ohio, has announced the appointment of R. E. Keidel as manager of the advertising and sales promotion department.

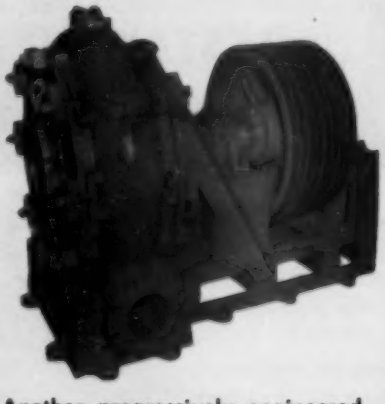
Tyson Bearing Corp., Massillon, Ohio, a subsidiary of SKF Industries, Inc., has elected A. Stewart Murray as president, replacing H. I. Lewis, who has resigned as president and as a director, but who will be available as a consultant and adviser. Mr. Murray has been assistant to the president of SKF and a Tyson director since March, 1955. Edwin R. Broden, president and a director of SKF, was elected chairman of the board of Tyson and a director. He succeeds Richard H. DeMott, who has resigned.

Mixermobile Manufacturers, Portland, Ore., has announced the following appointments: V. C. Dirksen, sales manager; Glen Ede, sales promotion manager; and Joe M. Larson, controller.

Union Asbestos & Rubber Co., Chicago, Ill., has named A. L. Hospers as southern regional sales manager of the heating and cooling division, which covers Alabama, Florida, Georgia, Louisiana, Mississippi, Tennessee, North and South Carolina, Arkansas, Oklahoma and Texas.

Foote Bros. Gear & Machine Corp., Chicago, Ill., has announced the appointment of Theodore C. Beug as advertising manager for both the industrial and precision divisions, and Richard H. Ewert as manager of gearing sales.

MECKUM ***Material Handling Pumps***



Another progressively engineered product. In sizes from 4" to 30".

★ **Low initial & operating cost.**

★ **Engineered individually for hydraulic efficiency and simplicity of maintenance.**

★ **All wearing parts made of alloys to suit various types of materials pumped.**

★ **Ease of assembly of replacement parts reduces shut down time.**

Also manufacturers and suppliers of complete dredges, pipe, fittings and equipment necessary to efficient production of materials.

Write us for details or nearest installation.

MECKUM ENGINEERING, INC.

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AUTO-VORTEX CLASSIFIERS... *proved "on-the-job"... through the years!*

MARYLAND

NEW YORK

MISSOURI

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ALABAMA

KANSAS

VIRGINIA

GEORGIA

WISCONSIN

ILLINOIS

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ALABAMA

The ability to produce sharp splits economically under widely varying conditions made Auto-Vortex Classifiers the selection for all these and many other successful sand gradation plants . . . some in continuous exacting production for over 25 years. And each year more and more sand producers are installing these long-proven Auto-Vortex Classifiers to lick gradation problems economically where other systems, more costly to install and operate, have failed.

A-V Classifiers, operating on little power and practically no maintenance cost, may solve YOUR problems of gradation and recovery of fines. Write for our Bulletin on AUTO-VORTEX CONE and BOWL CLASSIFIERS!

CHARLES E. WOOD COMPANY

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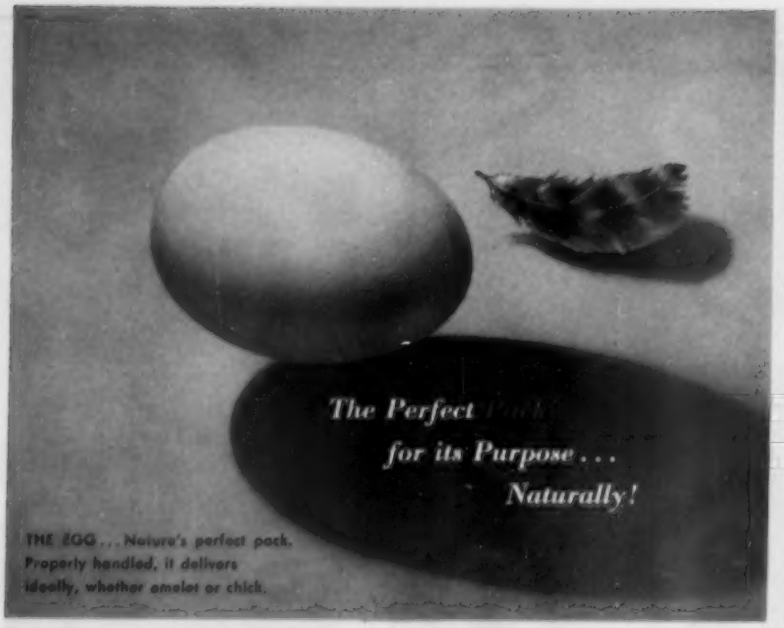

The Perfect
for its Purpose . . .
Naturally!
THE EGG . . . Nature's perfect pack.
Properly handled, it delivers
ideally, whether omelet or chick.

The Perfect Sack for Your Purpose . . . Naturally!

Hammond Multi-Walls

"TREES ARE A CROP"

- Constant, dependable supply due to completely integrated operation from forest trees to fine kraft Multi-Wall bags.
- Fast, reliable delivery assured by four strategically located plants:
  CHARLOTTE, N. C. • WELLSBURG, W. VA.
  PALATKA, FLA. • PINE BLUFF, ARK.
- Highest standards of quality assured by advanced research and control equipment.
- Speedy service from representatives in New York • Chicago • Minneapolis Kansas City • Cleveland • Baltimore Dallas • Charlotte, N. C. Ligonier, Pa. • Bluefield, Va.

HAMMOND BAG & PAPER COMPANY, INC.

Division of Hudson Pulp & Paper Corp

General Offices: Wellsburg, W. Va.

STANDS UP TO SEVERE USE
and even abuse

One word describes a Hayward —*ruggedness*. Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church St., New York 7, N. Y.

HAYWARD BUCKETS

CLAM SHELL · ELECTRIC · ORANGE PEEL · GRAPPLES

famous for performance since 1888

ROCK PRODUCTS FEATURES TIMELY INDUSTRY NEWS EACH ISSUE

Euclid Division, General Motors Corp., Cleveland, Ohio, has announced the appointment of Ray C. Call Co., South Charleston, W. Va., as distributor in all of West Virginia except counties of Brooke, Hancock, Marshall, Ohio, Morgan, Berkeley and Jefferson, and includes Garrett and Allegany counties in Maryland.

SKF Industries, Inc., Philadelphia, Penn., announces that Richard H. DeMott, chairman of the board and president, has relinquished the post of president but will continue to serve as board chairman. Edwin R. Broden, executive vice-president, succeeds Mr. DeMott as president and chief executive officer.

Dow Corning Corp., Midland, Mich., announces that Olin D. Blessing, sales manager, has been made a vice-president of the company. He has been with Dow Corning since it was organized in 1943.

Electric Steel Foundry Co., Portland, Ore., has appointed Gordon Ley as district representative in the Colorado area, with headquarters at Denver, Colo.

American Air Filter Co., Louisville, Ky., has announced the appointment of Richard W. Smith as director of advertising. John McConnell continues to serve as vice-president in charge of advertising.

The Yale & Towne Mfg. Co., Philadelphia, Penn., announces the appointment of Charles T. Schwarz as Chicago branch sales manager. He succeeds Roy L. Wolter who was recently appointed general manager of the Automatic Transportation Co. division in Chicago.

Fuller Co., Catasauqua, Penn., has appointed David W. Armstrong as manager of the new Kansas City, Mo., district sales office, which covers Kansas, most of Oklahoma, Nebraska and South Dakota, and western Iowa, Missouri and Arkansas.

Thermoid Co., Trenton, N. J., announces that Ronald S. Hulse has been elected vice-president and general manager of Southern Asbestos Co., a subsidiary, according to an announcement by Warren E. Hill, president. Mr. Hulse was formerly assistant to George S. Fabel, who recently retired as president.

Cleveland Pneumatic Tool Co., Cleveland, Ohio, has announced the appointment of William A. Roth as general manager to succeed Vern R. Drum, who has retired. He was formerly vice-president and assistant general manager.

Le Roi Division, Westinghouse Air Brake Co., Milwaukee, Wis., has opened a new branch plant in Tulsa, Okla., which will also be headquarters for the southwestern sales region and petroleum industry headquarters.

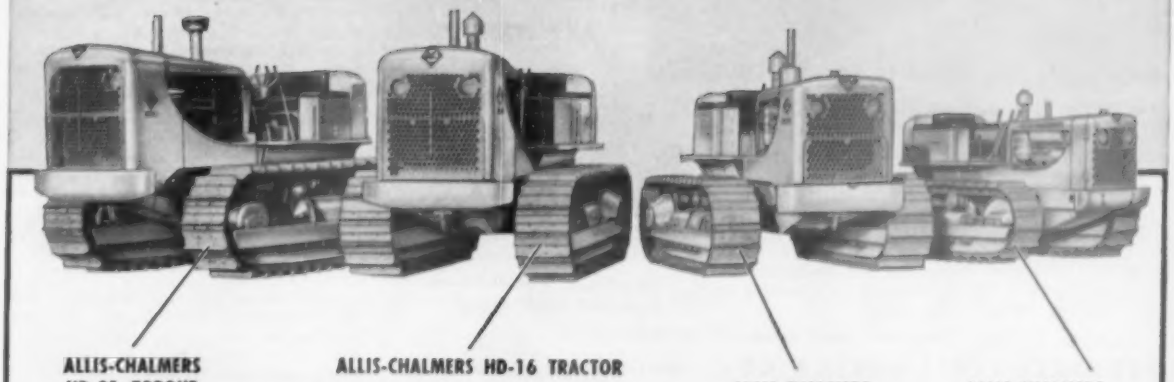
Smith Engineering Works, Milwaukee, Wis., announces the appointment of William P. McConnell as Pacific Northwest district manager in the states of Oregon, Washington and Idaho and the provinces of British Columbia and Alberta in Canada. He will make his headquarters in Portland, Ore.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces that Henry M. French has been named processing machinery sales representative in the industries group of the Tampa district. He was recently sales representative for the Florida Portland Cement Co., Tampa, Fla.

Gar Wood Industries, Inc., Wayne, Mich., has announced the appointment of Ralph W. Zahniser as manager of sales promotion and advertising.

The Master Builders Co., Cleveland, Ohio, has announced the appointment of Stephen W. Benedict as vice-president of research and engineering; Herbert K. Cook as director of engineering, and Thomas M. Kelley as director of research.

More features you want for high production . . . long life . . . low job costs



ALLIS-CHALMERS HD-21 TORQUE CONVERTER TRACTOR
Hp — 204 net engine
Weight — 44,000 lb
Drawbar pull — up to 65,000 lb

ALLIS-CHALMERS HD-16 TRACTOR

Standard Transmission
Hp — 141 belt
Weight — 31,500 lb
Drawbar pull — up to 37,700 lb

Torque Converter Drive
Hp — 150 net engine
Weight — 31,600 lb
Drawbar pull — up to 60,000 lb

ALLIS-CHALMERS HD-11 TRACTOR
Hp — 85 belt
Weight — 20,500 lb
Drawbar pull — up to 21,980 lb

ALLIS-CHALMERS HD-6 TRACTOR
Hp — 55 belt
Weight — 12,400 lb
Drawbar pull — up to 12,650 lb

HERE IT IS . . . the all-new Allis-Chalmers line of crawler tractors . . . with more of everything you've wanted most for steady output—more work power, more long-life features, more easy maintenance and easy operation features, more versatility in every tractor.

You get all the benefits of Allis-Chalmers advanced basic design with the new Allis-Chalmers diesel engine . . . proved torque converter drive for the HD-21 and HD-16 . . . all-steel box-A main frame . . . unit construction . . . 1,000-hour lubrication intervals for truck wheels, idlers, support rollers . . . double-reduction final drives, and many other profit-producing features.

And there's a complete spread of tractor equipment — hydraulic and cable dozers, heavy-duty winches, hydraulic rippers. You can choose from a full line of tractor shovels ranging from 1½-yd to 4-yd capacity.

Behind this equipment are dealers with sales and service personnel and facilities that assure you expert "after sales" care. The True Original Parts they stock help give you continued top performance and long equipment life.

Your Allis-Chalmers dealer will show you how these feature-packed crawlers can do your jobs better and at lower cost. See him for full details.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION,
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

FLEXCO

BELT FASTENERS and RIP PLATES

FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

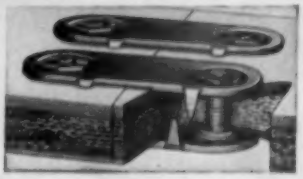
★ FLEXCO Fasteners make tight butt joints of great strength and durability.

★ Trough naturally, operate smoothly through take-up pulleys.

★ Distribute pull or tension uniformly.

★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.

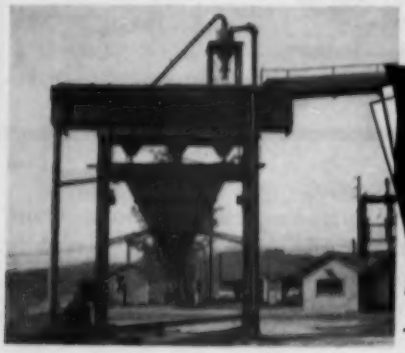
★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.



Compression Grip distributes strain over whole plate area

Order From Your Supply House. Ask for Bulletin F-112

FLEXIBLE STEEL LACING CO., 4684 Lexington St., Chicago 44, Ill.



"Very Pleased With Performance of Our Nagle Pump."

—OHIO GRAVEL CO.
Cincinnati, Ohio

"HAVE PURCHASED A SECOND UNIT FOR OUR MIAMI, OHIO, PLANT."

Ohio Gravel Co., like so many aggregate producers, has found that it pays to install pumps that are built to withstand abuse—Nagle Pumps. Their design and the wear-resistant materials used enable them to live with gritty liquids. For handling waste sand, classifier water and for small dredging operations, you can't beat a Nagle. Vertical and horizontal shaft types tailored to your specific needs. Send for Catalog 5206.

NAGLE PUMPS

NAGLE PUMPS, INC.
1269 CENTER AVE., CHICAGO HEIGHTS, ILL.

PUMPS FOR ABRASIVE AND CORROSIVE APPLICATIONS

Bemis Bro. Bag Co., St. Louis, Mo., announces that L. A. Linville, assistant director of sales in St. Louis, has been named to succeed R. D. McAusland as director of western operations, with headquarters in San Francisco. Mr. McAusland, vice-president and a director of the company, has retired after 56 years of service. Other appointments include Judson Bemis, executive vice-president; T. H. Ashton, director of central operations; C. W. Akin, manager of the Omaha plant and sales division; and R. M. Hersey, sales director for national accounts, who will be succeeded as manager of the Minneapolis general sales division by J. H. Eastman. M. F. P. Dallison has been made special account executive, and Stewart Eckers has been appointed manager of the Baltimore sales office.

Hensley Equipment Co., Inc., San Leandro, Calif., has appointed the following distributors: Contractors Equipment & Supply Co., Fresno, Calif.; Columbia Equipment Ltd., Vancouver, B. C., Canada; R. A. Young & Son, Tulsa, Okla.; W. L. Johnson Machinery Co., Midland, Texas; Doug-Lynn Mfg. & Mach. Co., Santa Rosa, Calif.; Wensel Machinery Rental & Sales, Kansas City, Kan.; and Complete Industrial Supply Co., Phoenix, Ariz.

Southwest Research Institute, San Antonio, Texas, announces a two-day conference on atomic energy to be held at San Antonio, Texas, on May 10 and 11, 1956. The conference will be held in cooperation with the Atomic Industrial Forum to acquaint business and commercial leaders of the Southwest and Mexico with atomic energy and its application to electric power generation and propulsion.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has announced the following sales representatives in the north central region: Robert E. Ochs, Cincinnati; Clifford R. Gentrup, St. Louis; and James W. Koontz and Robert E. Southard, Chicago.

Napco Industries, Inc., Minneapolis, Minn., announces that Robert L. Wicker has been appointed sales manager for the Federal Motor Truck division. He was formerly general sales manager for the Dart Truck Co.

Hyster Co., Portland, Ore., has promoted Walter A. St. Clair from district manager of the mid-central district to assistant sales manager of the eastern industrial truck division, with headquarters in Danville, Ill.

The Texas Co., New York, N. Y., announces that Texaco has opened a regional office of the technical service division in Atlanta, Ga., under the direction of J. F. Collins, Jr.

Gar Wood Industries, Inc., Wayne, Mich., has announced the merger of St. Paul Hydraulic hoist with Gar Wood Industries. The names Gar Wood-St. Paul have been combined and will appear on all name plates for truck equipment.

Yale & Towne Mfg. Co., Philadelphia, Penn., recently opened a new material handling sales and factory service branch in Detroit, Mich., to serve the lower Michigan Peninsula and Toledo, Ohio, areas. D. K. Wirth is branch manager and John R. Henderson is sales manager.

International Harvester Co., Chicago, Ill., has announced the appointment of Duane F. Kuntz as assistant manager of motor truck sales. He was formerly manager of the southwest motor truck sales region.

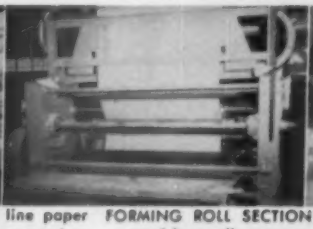
Aerequip Corp., Jackson, Mich., has opened a new warehouse in Dallas, Texas, with Clyde Stratton as manager.

The Colorado Fuel & Iron Corp., New York, N. Y., has announced the election of Hubert C. Smith as vice-president in charge of operations of the eastern division, with headquarters at Claymont, Del.

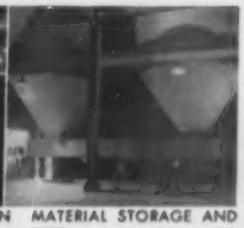
EHRSAM gypsum and wallboard processing machinery

...WILL MODERNIZE YOUR PLANT FOR GREATER EFFICIENCY AND BETTER PRODUCTS

PAPER SECTION for board line paper is fed to board line with proper tension — giving a smooth surface to finished product.



FORMING ROLL SECTION — precision rolls run on anti-friction bearings — giving board a uniform thickness throughout.



MATERIAL STORAGE AND FEED — stucco bins with drag feeders store and transfer sufficient material for constant operation.

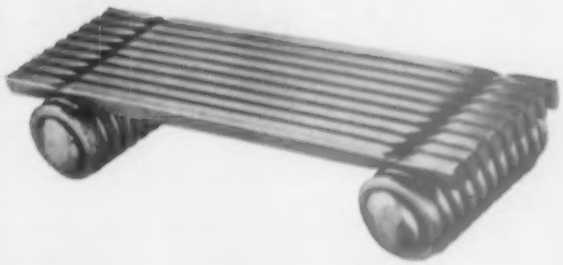
Ehrsam Lathe punch, can be furnished in Reciprocating or Rotary style with board speeds up to 300 ft. per min.

Ehrsam Calcining Kettle to reduce the raw gypsum to workable condition. Several sizes are available in gas or oil fired.

Ehrsam equipment will enable you to get the greatest returns from your plant by cutting maintenance and operating cost. Remember, if you are thinking of one machine or a complete plant, our staff of Engineers is available to you.

The J. B. EHRSAM & Sons Mfg. Co.
ENTERPRISE, KANSAS

THE LAST WORD IN SCREENING EFFICIENCY



The word's out on wedge wire and Hendrick has it!

That's right. With the addition of new Hendrick Wedge Wire, Hendrick now makes available a complete line of screens for the best in efficient, low-cost screening, dewatering and filtering operations. It's ideal wherever it is important that screen openings be minutely fine, have excellent draining qualities and a high degree of accuracy and rigidity. For details on how Hendrick Wedge Wire can best be applied to your specific requirements call your nearby Hendrick Sales Engineer.

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MANUFACTURING COMPANY
47 DUNDAFF STREET, CARBONDALE, PA.
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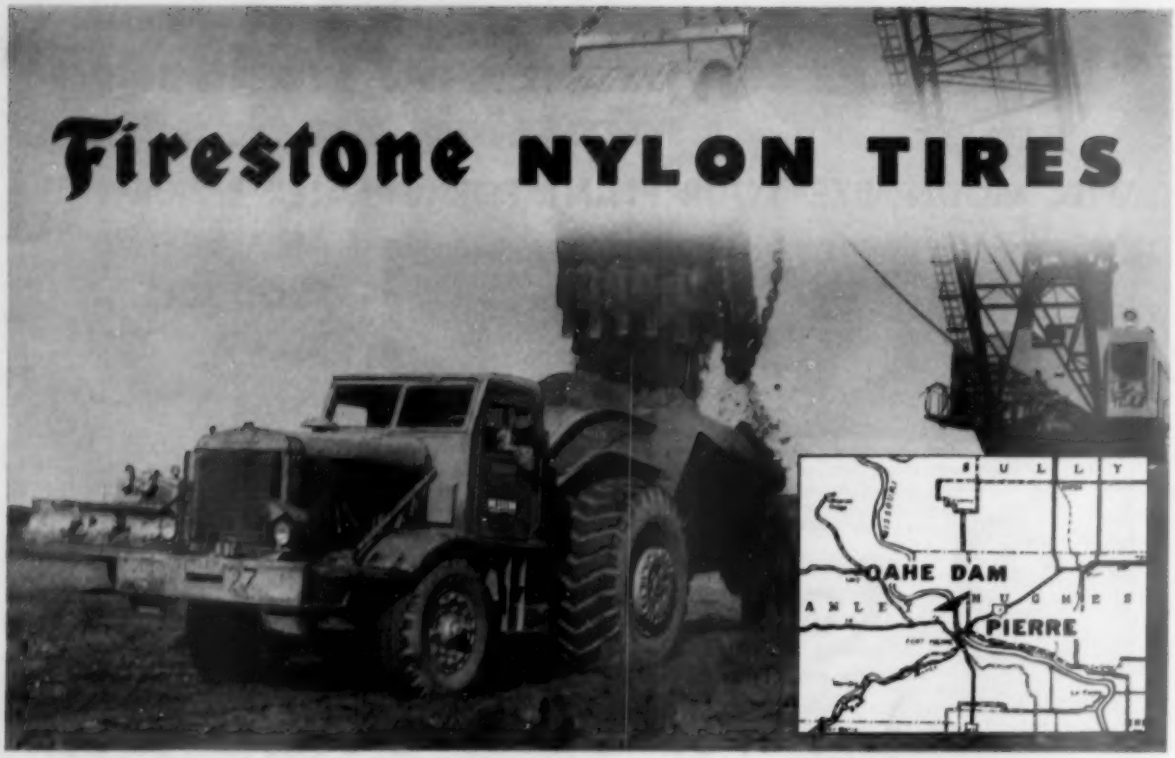
Perforated Metal • Perforated Metal Screens • Wedge-Slot and Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids • Hendrick Hydro-Dehazer

Firestone NYLON TIRES



MOVING 60,000 CUBIC YARDS A DAY TO HELP TAME THE MIGHTY MISSOURI

THE earthmoving unit shown above is typical of the many Firestone equipped units that are running round the clock to speed construction of Oahe Dam on the Missouri River. When completed, Oahe Dam will be the largest rolled filled earth dam in the world.

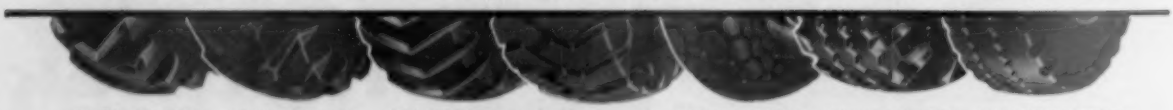
It is on projects such as this that Firestone nylon tires prove their superiority in reducing tire costs and downtime.

Firestone nylon tires are built for the toughest service. The treads give maximum traction and they are extra tough to resist cutting. Double-thick sidewalls give added protection against cuts and snags.

Firestone's Safety-Tensioned Gum-Dipped nylon cord body gives greatest protection against impact breaks . . . flex breaks . . . heat failures . . . and water damage.

Let your Firestone Dealer or Store show you how Firestone nylon tires will cut downtime and increase the profits on your job.

A TIRE FOR EVERY ROAD, LOAD AND CONDITION OF SERVICE



GROUND GRIP | GG WIDE BASE | ROCK GRIP | RG WIDE BASE | ALL NON-SKID | ALL TRACTION | RIB EXCAVATOR

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Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

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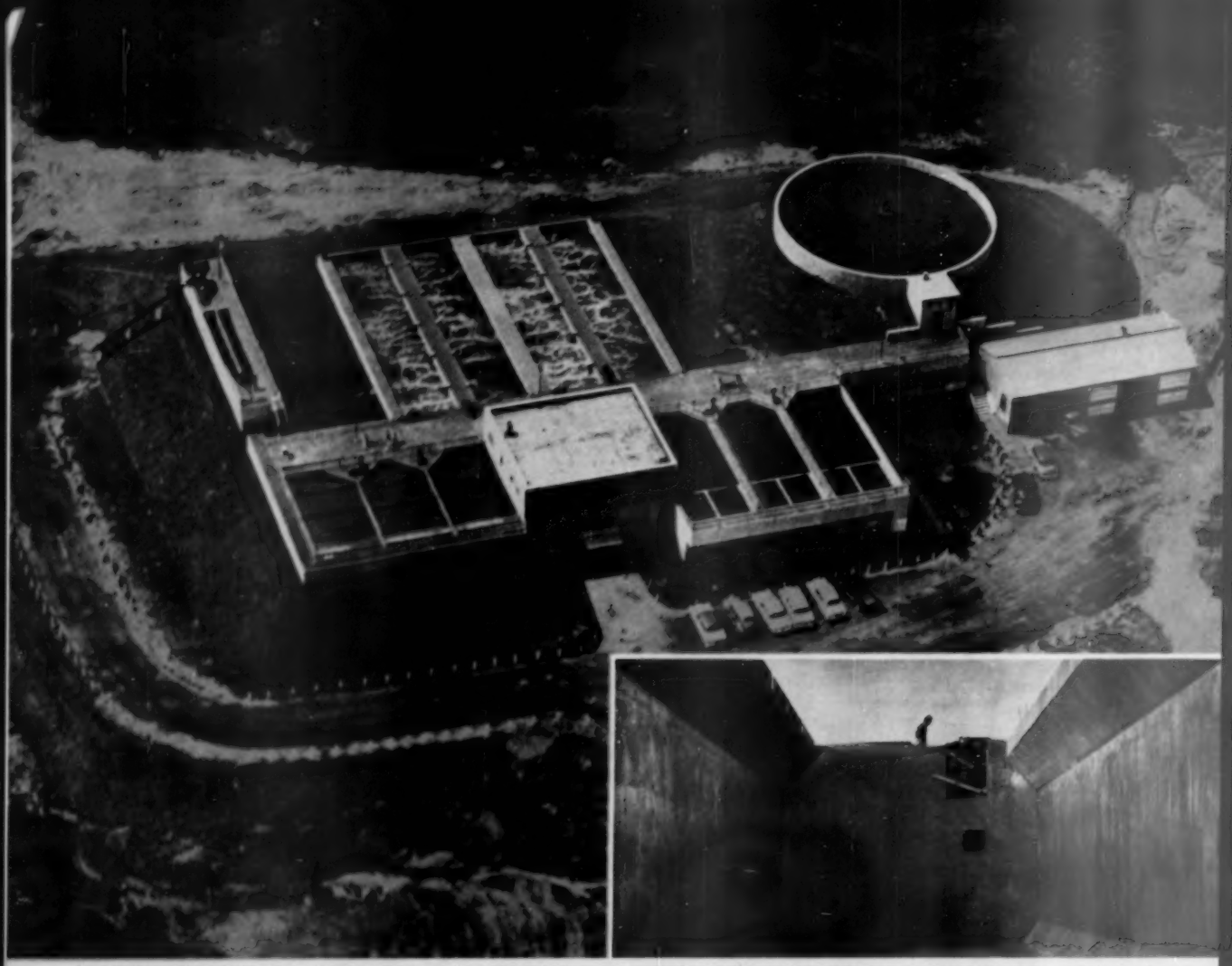
CONCRETE PRODUCTS

A SECTION OF ROCK PRODUCTS

CONCRETE UNITS · READY-MIXED CONCRETE

Installing prestressed channel slabs made by Nashville Breeko Block Co., Nashville, Tenn.



Aerial view of Sewage Treatment Plant, Valparaiso, Indiana. Duraplastic cement provides protection against freezing-thawing weather.

Construction view of tank shows Duraplastic-made concrete in place. Duraplastic gives excellent placeability and durability.

"Our contractors are completely satisfied with Duraplastic*"

. . . **said Ready-Mix supplier** Byron Smith, President of Smith Nuppnau Ready-Mix, Inc., Valparaiso, Indiana. "Duraplastic's ability to fortify concrete against freezing-thawing weather is outstanding, and the lack of segregation and reduced finishing time please contractors."

You, too, will get more durable, more uniform concrete with Atlas Duraplastic air-entraining portland cement, because you get a more plastic, more cohesive mix. Less mixing water is required for a given slump . . . segregation and water gain are minimized.

YET DURAPLASTIC COSTS NO MORE than regular cement—requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write:

UNIVERSAL ATLAS CEMENT COMPANY

UNITED STATES STEEL (USS) CORPORATION SUBSIDIARY

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*"DURAPLASTIC" is the registered trade-mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

CP D-181-C

AIR-ENTRAINING PORTLAND

Atlas® Duraplastic Cement

MAKES BETTER CONCRETE AT NO EXTRA COST

United States Steel Hour—Televised on alternate Wednesdays—See your local newspaper for time and station.

INDUSTRY NEWS

Cover Picture

ON THIS MONTH'S CONCRETE PRODUCTS COVER is shown a crane installing a prestressed concrete roof and floor channel slab made by Nashville Breeko Block Co., Nashville, Tenn. This company is credited with being the first to manufacture multi-unit prestressed concrete beams and girders. In addition to the multi-unit prestressed concrete structural units, the plant now has 1220 lin. ft. of casting beds for the manufacture of prestressed concrete channel slabs with an additional 210 lin. ft. to be added in the near future.

F.H.A. Policy on Exposed Concrete Masonry

THE QUESTION OF ACCEPTANCE of exposed interior concrete masonry walls has been discussed with Federal Housing Administration officials in Washington over a period of years. F.H.A. officials in Headquarters and in the Insuring Offices have accepted attractive applications of concrete masonry, which tend to create public appeal and saleability, however, an all concrete masonry exposed interior house takes in the extent of public appeal for such construction." Headquarters, in their manuals of guidance to Insuring Offices, give the following considerations: (1) heat transmission, (2) structural quality, (3) waterproof quality, (4) appearance of block, (5) quality of workmanship, (6) marketability, and (7) public acceptance.

The coefficient of heat transmission for various types of aggregate block is fairly well established, and the ability of the wall to carry superimposed loads is susceptible to structural analysis. The element of waterproofing for impermeability and penetration of water through possible cracks developing in the wall is not readily ascertainable. For this reason, the F.H.A. Minimum Property Requirements for Properties of One or Two Living Units, states: "Furring of not less than 1-in. thick wood strips shall be installed on exterior masonry walls less than 12 in. thick, unless otherwise acceptable to the Chief Underwriter." The problem of moisture penetration depends largely upon the climate, thus, in one part of Florida, plaster is permitted to be applied directly to 8-in. block; whereas, in another portion of the state, the exterior walls require furring. Minimum Requirements for Low Cost Housing, contains the same requirements as the above, except that portions concerning interior painting and decorating do not apply.

The acceptance of exposed block interiors is determined in the same manner as exterior wall design as far as the elements of heat transmission, structural quality and waterproof quality are concerned. There are no means available by which requirements may be specified to insure block of uniform texture and good appearance, nor can standards be prescribed to predetermine acceptable workmanship. Such considerations are made on an individual basis by the Insuring Office.

The problem of gaining acceptance of interior exposed walls resolves itself into promoting such construction at the Insuring Office level. The National Concrete Masonry Association has suggested that producers desiring to promote such construction should confer with their regional office chiefs of the underwriting, architectural, and the valuation sections. Standards of quality of appearance and workmanship can be established by the construction of a sample house, and real estate appraisers can provide testimony on public acceptance and marketability. F.H.A. will hesitate to venture into mortgage—insuring a large development of exposed concrete masonry walls, but may do so on a limited basis, for example, of five or six houses at one time.

Expands Concrete Plant

HOVEY CONCRETE PRODUCTS, INC., Flint, Mich., which recently completed a $500,000 expansion of plant facilities, has announced another expansion program costing about $250,000, to be completed by April, 1956. Concrete block production will be increased to 30,000 units daily; six steam-curing kilns, each with a 2000-block capacity, will be installed; and the capacity of cement storage facilities increased from 2000 to 3000 bbl. Sixteen vehicles will be added to the fleet, including six ready-mixed concrete trucks; four concrete block trucks and six gravel trucks. The firm has also changed its name to Atlas Concrete Products, Inc., as announced by Sherwin Palmer, president.

Concrete Products Plant

FIREPROOF BLOCK AND BUILDERS SUPPLY CO., Columbus, Ohio, is building a concrete block plant, with 14 curing rooms, machine shop, office buildings and a show room, at an approximate cost of $350,000. The company manufactures concrete roof slabs and joists, lintels and other concrete products, as well as concrete block. Peter J. Minck is president of the firm.

CENTRAL PRE-MIX CONCRETE company and Union Sand and Gravel company, Spokane, Wash., a wholly owned subsidiary, have announced an expansion program costing about $145,000. New equipment, including six trucks, two trailers and two transit mixers will be added, and a $75,000 stone crushing plant is being built at the sand and gravel property at Yardley, Wash.

RESCOLITE CO., Fort Smith, Ark., has completed expansion of its facilities at Fort Smith, designed to increase production of pre-sized expanded shale aggregate by 75 percent. The expansion was necessitated by the increased use of expanded shale aggregate for structural concrete and concrete products. In designing the plant, provision was made for additional capacity at a later date.

CONCRETE CONDUIT CO., Colton, Calif., a subsidiary of American Marietta Co. of Chicago, Ill., has purchased Tellyer Concrete Pipe Co., which has plants at El Paso, Texas, Albuquerque and Farmington, N. M., and Healdsburg, Calif. Elmer J. Johnson, president of Concrete Conduit Co., announced the acquisition.

HEMSTOCK BROS. CONCRETE PRODUCTS, INC., has been incorporated in Sparta, Wis., with an authorized capital stock of 1250 shares of common stock at no par value. Incorporators are Cecil and Thomas Hemstock of Sparta, Wis.

THE JENSEN BLOCK & SUPPLY CO., Racine, Wis., has purchased the Waylite Concrete Masonry Co., also at Racine. The company continues to manufacture concrete block, Waylite and Ranchstone.

MARSHALL LIMESTONE PRODUCTS CO., Gunthersville, Ala., is building a plant costing about $125,000, for the production of ready-mixed concrete, road stone, and agricultural limestone. The company has leased a limestone quarry from Buck King of Gunthersville.

THE WESTERN CONCRETE AND EQUIPMENT CO.'s proposed plant at Santa Ana, Calif., may be approved by the County Planning Commission. The area is zoned for general agriculture, but approval has been recommended.

MAINE CEMENT PRODUCTS CO., Portland, Maine, has begun operations, with a production of 2,000,000 concrete or cinder block annually.

DRAKE CONCRETE CO., INC., Monroe, La., has changed its name to Monroe Concrete Co., Inc., and increased its capital to $100,000.

F506M 175"WB. SALES ORDER 4250

City Scales **Nº 8621**

SERIAL # 519595

Lansing, Mich. Jul 1 1956

From Reo

To Cab & Chassis

One Load Gross 11240

Tare 5320

Driver Net 5960

Charge 50 Cents

WALTER M. SAXTON
City Weighmaster

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14,000 lbs.

HAUL 6½ YDS. WITHIN

Low-Weight Chassis Design of New Reo F-506M Guarantees it!

Only 11,240 lbs. That's the certified low chassis weight of the new Reo F-506M. The official weighmaster's receipt above proves how it can haul 6½ yds. of concrete and stay well within legal limits. The new Reo F-506M is designed and built specifically for mixer use. Its increased payload is made possible by Reo's new high-strength, low-weight *double-side-rail frame construction.*

The new Reo F-506M actually hauls up to 2 yards more than the average mixer chassis. And it places as much as 6,000 pounds more on the front axle than other conventional mixer trucks.

Reo full power steering, which is standard, makes

Powered by Reo's Own OH 160 Gold Comet Engine—Gas or LPG . . .

REO

WORLD'S TOUGHEST TRANSIT MIX TRUCKS

32,000 lb. TANDEM LIMIT

maneuvering easy in tight places anywhere, on or off the highway.

Under the hood of the new F-506M is Reo's own powerful 160 hp short-stroke, wet-sleeve Gold Comet Engine. Plenty of power to operate both truck and mixer under the toughest job conditions. And, it's backed by Reo's famous *100,000 mile or one year warranty.*

Remember, Reo's exclusive *front-axle-payload* design places more weight forward—giving you an extra 2 cubic yards of concrete every trip. With it, you can haul your regular daily volume with fewer trucks and drivers . . . or increase volume without increasing your fleet.

For states that permit greater axle loadings than 32,000 lbs., Reo builds the F-536M—52,000 lbs. G.V.W.

Additional hundreds of pounds can be added to the carrying capacity of the new Reo F-506M with Reo's optional front-end power take-off. The PTO also eliminates extra fuel and maintenance costs of the mixer's auxiliary power unit.

Call your factory branch representative or distributor today and get the facts on the Reo that's right for you. Mail the coupon for full information on the F-506M, the front-end power take-off unit, or Reo's outstanding line of rugged tandems for every construction job.

Backed by Reo's Own 100,000 Mile or 1 Year Warranty!

Mail For Information!

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LANSING 20, MICHIGAN
SUBSIDIARY OF **BOHN** ALUMINUM AND BRASS CORPORATION

Please send at once:

☐ Complete Specifications on F-506M. ☐ Reo Front-End Power Take-Off. ☐ New Tandem Catalog.

NAME _____
COMPANY _____
TITLE _____
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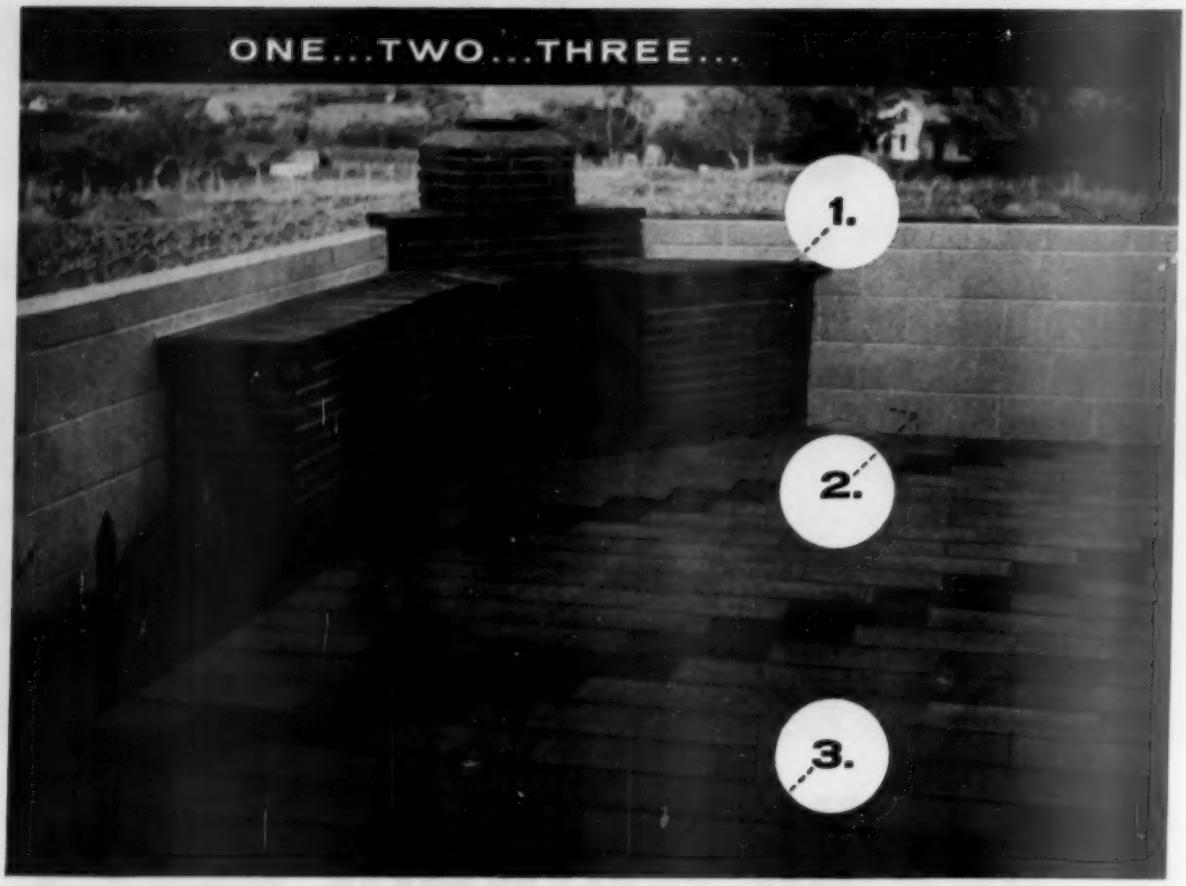


WAYS TO BUILD **NEW BUSINESS!**

1. The barbecue fireplace is split-stone concrete block.
2. The wall is of standard concrete block.
3. The floor is patio concrete block.

And the whole—one, two, three—adds up to an effective example of how one concrete block manufacturer is employing different types of concrete units to build new business.

It is a good example—and it is just one example out of very, very many. For wherever *new* and *unusual* uses of concrete units are found, new and more profitable sales opportunities are created for the concrete block manufacturer—proving, again, that imagination and profit go hand in hand.

A study of the construction needs in your own vicinity may uncover new opportunities for you. And for products that will give complete satisfaction, include Lehigh Cements in your plans. Remember there's a Lehigh Cement to help you produce quality units with any manufacturing process.

LEHIGH MORTAR CEMENT
LEHIGH PORTLAND CEMENT
LEHIGH EARLY STRENGTH CEMENT
LEHIGH AIR-ENTRAINING CEMENTS

LEHIGH PORTLAND CEMENT COMPANY
ALLENTOWN, PA.

FORT WORTH SAND AND GRAVEL CO. V. P. CHARGE OF SALES, GEO. A. MEIHAUS, SAYS:

"Radio saves us $10.00 a day per truck"

Mixer driver Alvin E. Hobbs has just received instructions to proceed directly to his next job without going back to plant.

From his mobile repair van J. A. Markham talks directly to drivers, often diagnoses trouble so driver himself can make emergency repairs.

Chief radio dispatcher Coy Anderson gives instructions to a driver miles away.

READY MIX OPERATORS:

HERE IS CONSTANT CONTROL OF 51 TRUCKS OPERATING BETWEEN 5 PLANTS

Diverting trucks as needed to handle the output of five separate mixing plants was a king-size job. But Motorola 2-way radio has reduced it to everyday routine for the Fort Worth Sand and Gravel Co. of Texas.

Constant radio control—every minute of the day—of every one of the 51 mixers has resulted in a *saving* of about 20% in mileage per yard of delivered concrete. Drivers get their new orders *at the job site*, and usually go *directly* to the next job without needless travel. Radio actually gets an *extra hour* of bonus production daily from every truck.

Besides speeding delivery and giving better customer service, Motorola 2-way radio has cut costs many other ways. Overtime of drivers and batch plant personnel has been slashed at Fort Worth. Telephone "hunting" by drivers has ended . . . reports are sent and orders received right in the cab. One radio equipped service van does the work of two . . . speeding repair and cutting down-time.

Five supervisors, out most of the time in their radio equipped cars, have instant contact with the main office. Meihaus says his company wouldn't be without 2-way radio now.

Find out how Motorola 2-way radio can pay for itself quickly by cutting costs for *you*, and go on to earn extra profits month after month. A Motorola Engineer will show you how. Write, phone or wire—TODAY!

MOTOROLA

2-WAY READY MIX RADIO

MOTOROLA COMMUNICATIONS & ELECTRONICS, INC.
A SUBSIDIARY OF MOTOROLA, INC.
4501 AUGUSTA BOULEVARD • CHICAGO 51, ILLINOIS
ROGERS MAJESTIC ELECTRONICS LTD., TORONTO, CANADA

Motorola consistently supplies more mobile and portable radio than all others combined.
Proof of acceptance, experience and quality.
The only COMPLETE radio communications service—specialized engineering . . . product . . . customer service . . . parts . . . installation . . . maintenance . . . finance . . . lease.
"The best costs you less—specify Motorola."

World's Longest Highway Bridge Is Prestressed Concrete. The roadway of the Greater New Orleans Expressway crossing Lake Pontchartrain is being layed with concrete slabs 56 feet long and 33 feet wide precast with curb and gutters and prestressed with 175 separate Tufwire Strands.

Prestressed Concrete is a "Comer" with Adaptability Unlimited...

Almost anything that concrete will do—it will do better when prestressed. As a matter of fact, prestressed concrete may be used in sections which are not possible with reinforced concrete.

It is structurally sounder because the compressive stress imposed by prestressing cancels out tensile stresses against which concrete is inherently weak. Tension cracking is minimized.

Prestressed concrete is economical—fully competitive. Less concrete and less steel is needed.

The designing of prestressed members is not difficult when based upon a fundamental knowledge of the strength and mechanics of materials. Many experienced designers and engineers now offer dependable consultive service to firms who have or are about to enter into the most promising business in the construction field — the manufacture of prestressed concrete products.

The adaptability of prestressed concrete is unlimited. Here are a few concrete products now being prestressed. I beams, T purlins, tilt-up and tongue and groove wall siding, channel panels and slabs for floors and roofs, pipe and tanks, fence and lamp posts, highway and airport slabs, bridge and wharf pile, slabs, stringers and girders, complete warehouses, shopping centers, stadiums, gymnasiums, schools and commercial and industrial buildings.

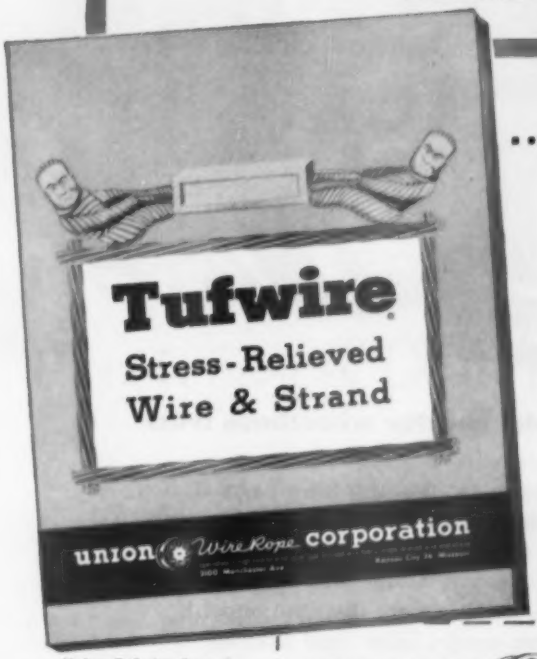
Prestressing offers opportunities not only to on-site contractor, but also to the permanent site fabricator of concrete products of every description. We can put you in touch with reliable engineering and design consultants. Our engineers will work closely with you on your stress relieved wire and strand specifications.

Tuffy®
says
We Gotta Build More Roads and Bridges

Prompt Delivery Available...
Contact Us On Your Requirements

UNION Tufwire®

Wire & Strand



Union Tufwire Strand may be ordered in coils or in reels.

...for ANY SIZE Prestressed Concrete Job!

The jobs don't come too big or too small for on-schedule supply of Union Tufwire (Wire or Strand) —whether it's for the world's longest highway bridge (pictured above) or a one-story building. Even though the demand for Tufwire has taken mighty big strides ahead, we stay ahead of present demand, and we're geared for the future.

The research and production facilities of Union Wire Rope Corporation have been geared to the seven-league strides of prestressed construction since the trend began shaping up some ten years ago. Our expanding plant capacity and central location in Mid-America have made us the ideal source of supply for the strand and wire that form the "tendons" of prestressed concrete.

MAIL THIS COUPON TODAY!

union Wire Rope corporation

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand.

2302 Manchester Avenue, Kansas City 26, Missouri

FREE!

Concise, authoritative handbook covering the subject of prestressed concrete, complete with tables of Union **Tufwire** specifications.

Please rush my free copy of the Tufwire Book.

MY NAME _____ TITLE _____

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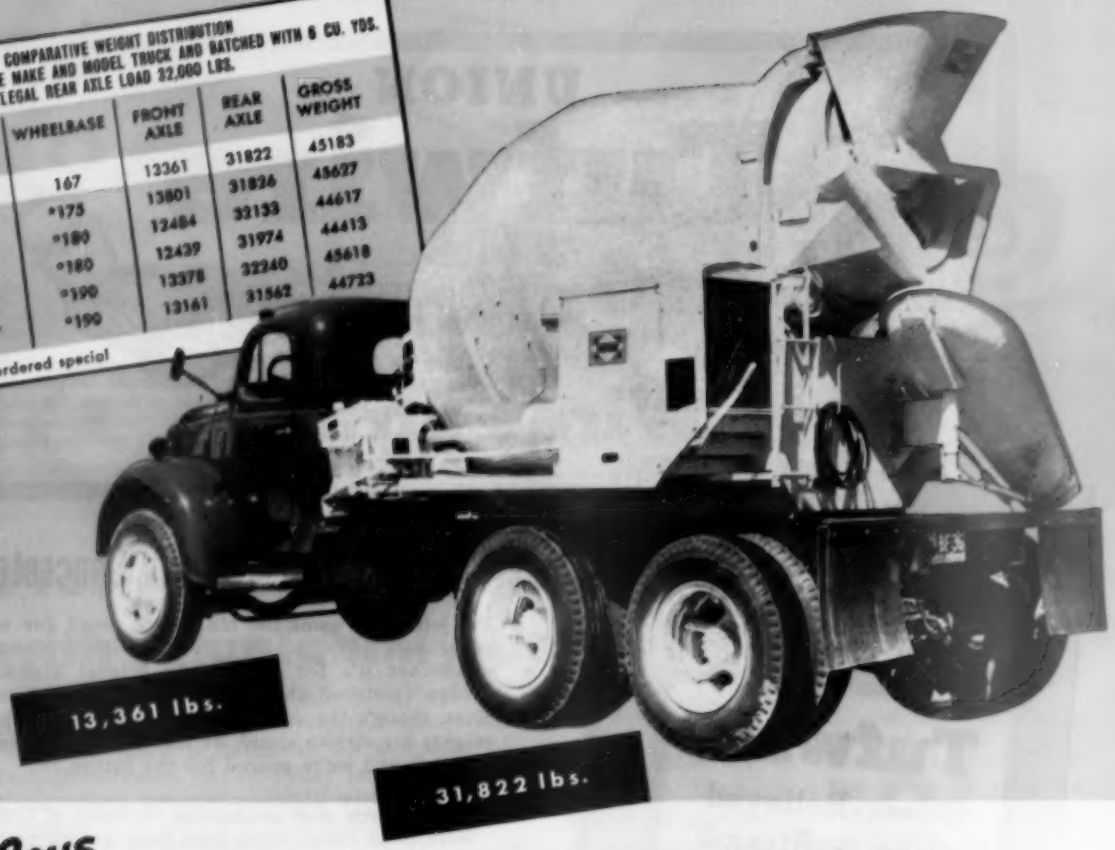
Compare BLAW-KNOX TRUKMIXERS *with ordinary truck mixers for better weight distribution on* SHORTER WHEELBASE TRUCKS

COMPARATIVE WEIGHT DISTRIBUTION
ALL MIXERS ON SAME MAKE AND MODEL TRUCK AND BATCHED WITH 6 CU. YDS.
LEGAL REAR AXLE LOAD 32,000 LBS.

LOAD ON THE ROAD	WHEELBASE	FRONT AXLE	REAR AXLE	GROSS WEIGHT
BLAW-KNOX	167	13361	31822	45183
MIXER "A"	*175	13801	31826	45627
MIXER "B"	*180	12484	32133	44617
MIXER "C"	*180	12439	31974	44413
MIXER "D"	*190	13378	32240	45618
MIXER "E"	*190	13161	31562	44723

*Must be ordered special



Hi-Boys mount on a more maneuverable, shorter wheelbase truck

WHEN YOU STUDY the table above you can see why Blaw-Knox Hi-Boy TRUKMIXERS can be mounted on shorter wheelbase trucks. Mounting the motor at the rear and the transmission at the end of the combination pedestal water tank, permits center of weight to be moved 20″ forward and shortens the overall length. This gives better weight distribution with more weight on front axle so you can carry bigger *legal* payload.

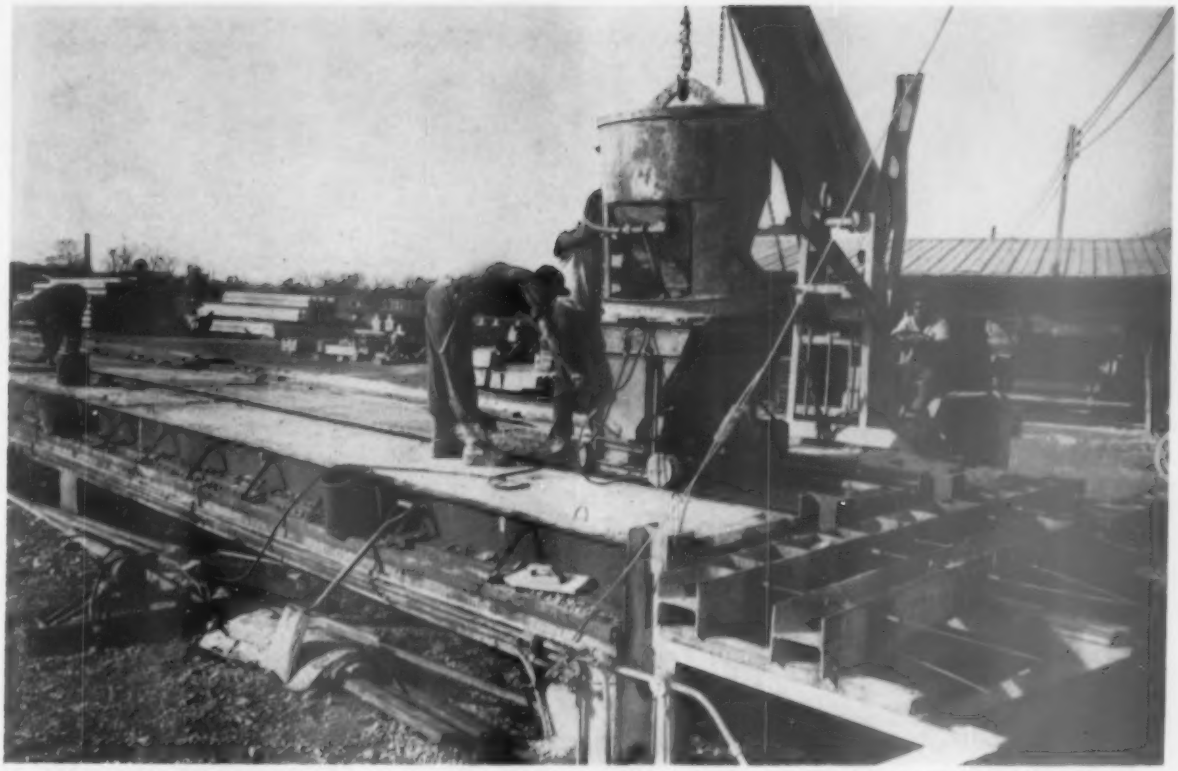
Another Hi-Boy feature that assures better weight distribution and most efficient mixing is the larger diameter drum that mixes even zero slump concrete quickly and keeps the batch weight at the front of the mixer. Pedestal and flush water tanks are also combined to reduce weight by approximately half a ton and lower the center of gravity of the unit. There are dozens of other practical, profitable features in these units you will want to investigate. Call your Blaw-Knox distributor today.

BLAW-KNOX

BLAW-KNOX COMPANY

CONSTRUCTION EQUIPMENT DIVISION

Mattoon, Illinois



Crane lowers ¾-cu. yd. bucket of concrete over self-powered hopper which moves on rails built into casting bed for the manufacture of prestressed channel slabs. Attachments on hopper also vibrate and screed concrete

CASTING LONG-SPAN Prestressed Concrete Channel Slabs

• Nashville Breeko Block Co., Nashville, Tenn., producing large volume of prestressed cast concrete channels and also prestressed, multi-element beams and girders

By HUBERT C. PERSONS

FACILITIES FOR CASTING long-span prestressed channel slabs have recently been added by Nashville Breeko Block Co., Nashville, Tenn. This company is credited with having made the first prestressed concrete block beams in America. The multi-element prestressed beams and girders designed in 1950 by Ross H. Bryan, then of the consulting engineering firm of Bryan & Dozier, have produced a substantial volume of block business. They were first used in a stadium at Fayetteville, Tenn., and in a bridge in Madison County, Tenn.

The Breeko Block Co. was organized in 1926 and until 1950 produced only concrete masonry units, precast joists, sills and lintels and a few special concrete items. In 1950 Mr. Bryan suggested to Carroll Strohm, Jr., Breeko's general manager, that a multi-unit prestressed beam assembled from machine-made concrete block would be economical and would have many practical applications. Realizing that the idea offered a new outlet for his company's products, Mr. Strohm furnished block for the tests and cooperated in the early experimental work.

In 1955, with block sales of approximately 5 million 8- x 8- x 16-in. equivalents, the dollar volume of prestressed concrete products sales amounted to over 40 percent of the total dollar volume of sales.

Now in addition to 500 lin. ft. of casting beds for multi-unit joist, girders and beams, the plant has 1220 lin. ft. of casting beds 3 ft. 2 in. wide for prestressed concrete channel slabs for floors and roofs. An additional 210 lin. ft. is to be added soon.

In 1953, Mr. Strohm with Mr. Bryan as the company's consulting engineer, began making prestressed long-span channel slabs to be supported on prestressed block girders. Because of the enthusiastic reception of these long-span channel slabs by engineers, architects and contractors in the Nashville area, the first 400-ft. casting bed was extended to 800 ft. after six months. About the middle of 1954 an

Three 200-ft. casting beds with prestressed channel slabs 10 in. deep, 3 ft. 2 in. wide, 30 ft. long; Carroll Strohm, to the left

A 50-ft. prestressed channel slab being inspected is ready for installation on the job

additional 200 ft. was built, providing 1000 lin. ft. of casting bed. With these facilities the casting yard had a daily capacity of 3000 sq. ft. of channel slabs.

Prestressing operations occupy approximately three acres of the seven-acre plant site. The long-span casting beds are entirely out-of-doors, the climate of Nashville permitting outside work about nine months of the year.

Manufacturing Procedure

In moderate to warm weather, the concrete for the long-span slabs is a 7-sack mixture of high-early-strength portland cement with a slump of from 1 in. to 1½-in. In cold weather an additional ½ bag of cement and a small percentage of calcium chloride are sometimes used.

For cold weather curing, 250,000 B.t.u. Herman Nelson portable heaters are used to supply heat under the full length of the casting beds. Slabs are covered with sisalkraft paper during curing. Compressive strength of 3500 p.s.i. is attained in 18 hr.

Concrete is placed in the casting bed forms from a ¾-cu. yd. bucket carried by a 10,000-lb. Hyster Karry-Krane. A self-powered "pouring machine" or mobile hopper, operates on rails built into the casting bed. This device also vibrates and screeds the concrete. With it one man can place 3000 sq. ft. of concrete in 6 hr.

Seven-strand cable, either $\frac{7}{16}$-in. or ⅜-in. diameter, is used for prestressing the channel slabs. Each slab is separated by a steel bulkhead through which the cables are run. The cables are tensioned up to 120,000 p.s.i. by use of hydraulic jacks with gauges. A careful check is also made of the elongation of cables during tensioning. When the concrete has attained the proper strength to assure adequate

Showing a 250,000 B.t.u. portable heater being used to force warm air under casting bed

D. B. Eaker, laboratory technician, in plant laboratory where sieve analysis and compression tests are made

bond the cables are severed with a cutting torch. In addition to the prestressing cables, the slabs are also reinforced with 4 x 4 No. 10 steel mesh.

Test cylinders are cast of the concrete in each batch used for the channel slabs. These are tested for compression strength the following day to be certain that the concrete has the required strength before the cables are cut.

Hooks made of reinforcing bars are cast into the channel slabs to facilitate removal of slabs from the forms and setting on the job. Lifting is done at four points with a Hyster Karry-Krane with spreader bar and chains. After the slabs are set in place the lifting hooks are either beaten down with a sledge if a topping slab is to be placed or burned off flush with a cutting torch.

The plant laboratory occupies a separate building located between the casting yard and the block plant. This laboratory has a 300,000-lb. Forney compression testing machine in addition to all equipment required for sieve analysis and all standard A.S.T.M. tests.

Multi-Unit Structural Members

Fabrication of the prestressed multi-unit structural members is carried out in a building especially equipped for the purpose. Machine-made, heavy aggregate block having a 28-day compressive strength of 4000 p.s.i. are assembled on a 16-in. wide casting bed to form girders, beams and lintels. This width will accommodate two 8- x 12-in. joist or one 14- x 24-in. girder beam.

When the block units are assembled to the specified length they are bonded together with mortar, and tensioning cables are threaded through the cores. The tensioning cables are of the same dimensions as those used in the prestressed channel slabs. Tensioning to 120,000 p.s.i. is done with hydraulic jacks, using the same equipment as for the channel slabs. A rich cement grout is then pumped into the block cores through holes previously bored, in order to bond the cables. Covers are placed over the entire assembly and low pressure steam is turned on for curing the grout. Within 24 hr. the grout has reached the strength required to allow cutting the tensioning cables.

Like the channel slabs, lifting hooks are cast in the multi-unit members. Both the channel slabs and the multi-unit members are delivered to the job site by tractor-trailer units and are set with a crane directly from the trailer. Prices of both types of prestressed structural units are quoted either in place or to be erected by the customer.

Left: Multi-element joist, 12 in. deep x 5 in. wide and 23 ft. long, with reinforcing under tension. **Right:** Multi-element joist being grouted

Six company-owned tractor-trailer units with other company-owned trucks take care of approximately 50 percent of the deliveries of block and structural members. Other deliveries are made by contract truckers.

The Breeko plant makes both heavy and lightweight concrete masonry units which are sold under the trade name Breeko Block. There are nine curing rooms adjacent to the area housing the three Besser Vibrapac block machines. These rooms are 120-ft. long and three block racks wide.

The curing cycle is 4 hr. in low pressure steam at 160 deg. F., then a 12 hr. soaking period after which the room is opened and the block removed for air drying in the yards. Steam for curing is provided by two Cyclotherm steam generators, one of 100 hp. and the other of 80 hp. capacity.

Three Towmotor, one Yale and two Buda fork lift trucks are used in moving block to and from the curing rooms, to stockpile and to load trucks for delivery. The Yale is rated at 7500 lb. capacity; the others are 6000 lb.

There are approximately 1200 ft. of concrete runways in the yards permitting easy access to all stockpiles. Two complete stocks of block are maintained; lightweight and heavy in all standard shapes and modular dimensions. Expanded slag aggregate is used in the lightweight block.

Daily newspaper advertising, bill boards, city bus posters and occasional radio and television time are used to promote prestressed concrete and Breeko block. The local newspaper advertising is prepared in news style, generally featuring a current construction project on which prestressed concrete or block have been used.

Zonolite Sales Meeting

ZONOLITE CO., Chicago, Ill., recently held a sales meeting, at which predictions were made for continued growth of the construction industry, and record sales of vermiculite in 1956. D. J. Boone, merchandising manager, spoke on the use of vermiculite on major construction jobs. He cited as an example, the Prudential Building in Chicago, where 45 carloads of Zonolite were used in fireproofing ceilings. Gains in all major Zonolite products were also reported by Mr. Boone as follows: home insulation, 10.3 percent; plaster aggregate, 11.4 percent; concrete aggregate, 12.6 percent; and acoustical plaster, 44.2 percent. Cost-cutting developments for concrete installations using vermiculite were discussed, and R. W. Sterrett predicted the developments would increase the use of vermiculite as a concrete aggregate more during 1956 than in the record years of 1955 and 1954.

Wisconsin Concrete Products Meeting

WISCONSIN CONCRETE PRODUCTS ASSOCIATION, with a membership of approximately 60 Wisconsin concrete block and allied firms, held a two-day convention January 11 and 12, 1955, at the Plankinton Hotel, Milwaukee. Speakers included L. L. Cunningham, president of the Business Institute, Milwaukee; Morris H. Gross, Detroit, Mich.; and W. D. Kimmel and Felix R. Weirman, of the Portland Cement Association, Milwaukee.

Officers elected were Carl Thompson, Thompson Products Co., Kenosha, president, succeeding Loyal Clark, Wausau, Wis.; A. W. Devos, Devos Block Co., Milwaukee, executive secretary and treasurer; Cecil Hemstock, Hemstock Brothers, Sparta, first vice-president; and Eugene Kleist, Eau Clair, second vice-president.

Concrete Batching Plant

STANDARD INDUSTRIES, INC., Tulsa, Okla., has begun operations at a permanent ready-mixed concrete batching plant located on a five-acre site in Tulsa. J. D. Metcalfe, vice-president and general manager, has estimated that the total cost of the plant, including equipment and trucks, will be about $150,000. The plant is supplying contractors on the northeast turnpike and the four-lane construction of U. S. 66. It has a capacity of from 400 to 500 cu. yd of concrete daily.

Dispatch office at Yard 6, Chicago, with dispatcher Ed Sekins at left transmitting order to batch operator via Telautograph

Batch plant operator at Yard 1, checking off order received from dispatcher via Telautograph. Note push-button controls

Efficient DISPATCHING SYSTEM Speeds Up Ready Mix Deliveries

• Material Service Corp., Chicago, Ill., operating 13 ready-mix plants and 175 mixer trucks in the metropolitan area, has a central ordering system with intercommunication in the plants and two-way radio system for trucks

By KENNETH A. GUTSCHICK

SINCE ENTERING THE READY-MIXED CONCRETE FIELD in Chicago in 1949, Material Service Corporation has been one of the industry's biggest producers. By following a policy of consistently delivering on time a quality product, the company has built an enterprise encompassing 13 Chicagoland ready-mix plants with a total of 175 mixer trucks.

To handle its big volume of business and simultaneously render maximum service, Material Service has closely integrated its entire operation by developing a highly efficient dispatching and communications system.

Part of the 15-man order board, located in the company's downtown Chicago office building, where ready-mixed concrete and other building material orders are received and processed. The ready-mixed concrete section is in the background

The heart or nerve center of the operation is the order board, located in the company's main office in downtown Chicago, where all orders are received by telephone, processed, and transmitted by teletype to the respective plants. At the yard, orders are efficiently expedited by the dispatcher through use of intercom and Telautograph units for contacting the batch plant operator and two-way radio for maintaining close contact with each driver. Thus, from order taking to job-site delivery, the operation is tightly coordinated. This article will deal primarily with this communications system, and also consider the variety of business forms used in processing ready-mixed concrete orders.

Material Service, operating at 24 different locations in northeastern Illinois and northwestern Indiana, is one of the nation's largest building material and supply firms. It produces nearly all of the aggregates used in its ready mix operations, obtaining crushed stone from quarries in Chicago, Thornton, Lyons, and McCook, Romeo*, and sand and gravel from

Truck mixer loading up at Yard 1; dispatch office is to the left. The driver can converse with batching operator by intercom set

Dispatcher Bob Nelson at Yard 1 contacting driver by means of two-way radio. Note visible margin dispatch rack for order shippers

plants in Lockport, Algonquin, and Morris, Ill., and Cayuga, Ind. These production centers are tied to its 15 building material yards blanketing the Chicago area through water, rail, and truck transportation. Eight of these distribution yards are served with the company fleet of five towboats and 80 barges.

The map, on page 190, shows the company's network of ready-mixed concrete plants in the Chicago area. The six Chicago and seven suburban plants are strategically located with respect to both markets and raw materials. Plants are spaced about 4 to 10 miles apart, so that deliveries are generally within a radius of four miles and seldom over 10 miles (suburban deliveries are somewhat longer). Three of the plants are located at aggregate production centers (Lockport, Thornton and Lyons) and six at docksite yards.

Six of the plants incorporate central mixers, including 4-, 6½-, and 7½-cu. yd. units. These plants are evenly distributed, enabling the company to readily serve the entire metropolitan area with central-mixed concrete. Central mixing also permits greater payloads — an important feature in rendering maximum service in supplying ready-mixed concrete.

The company entered the ready-mixed concrete business in 1947, setting up a small plant at Lockport; but it was not until 1949, the year that ready-mixed concrete first came to Chicago, that it became a major producer. Within a year after setting up its first Chicago plant, it had eight plants and a fleet of 100 transit mixers in operation. Additional plants were built later in outlying centers to serve rapidly developing construction markets. The newest plant, built in June, 1955, is located adjacent to O'Hare Airport, to supply concrete for transforming this jet airbase into a major commercial airport.

*A fifth quarry at Fairmount, Ill., serves local markets only.

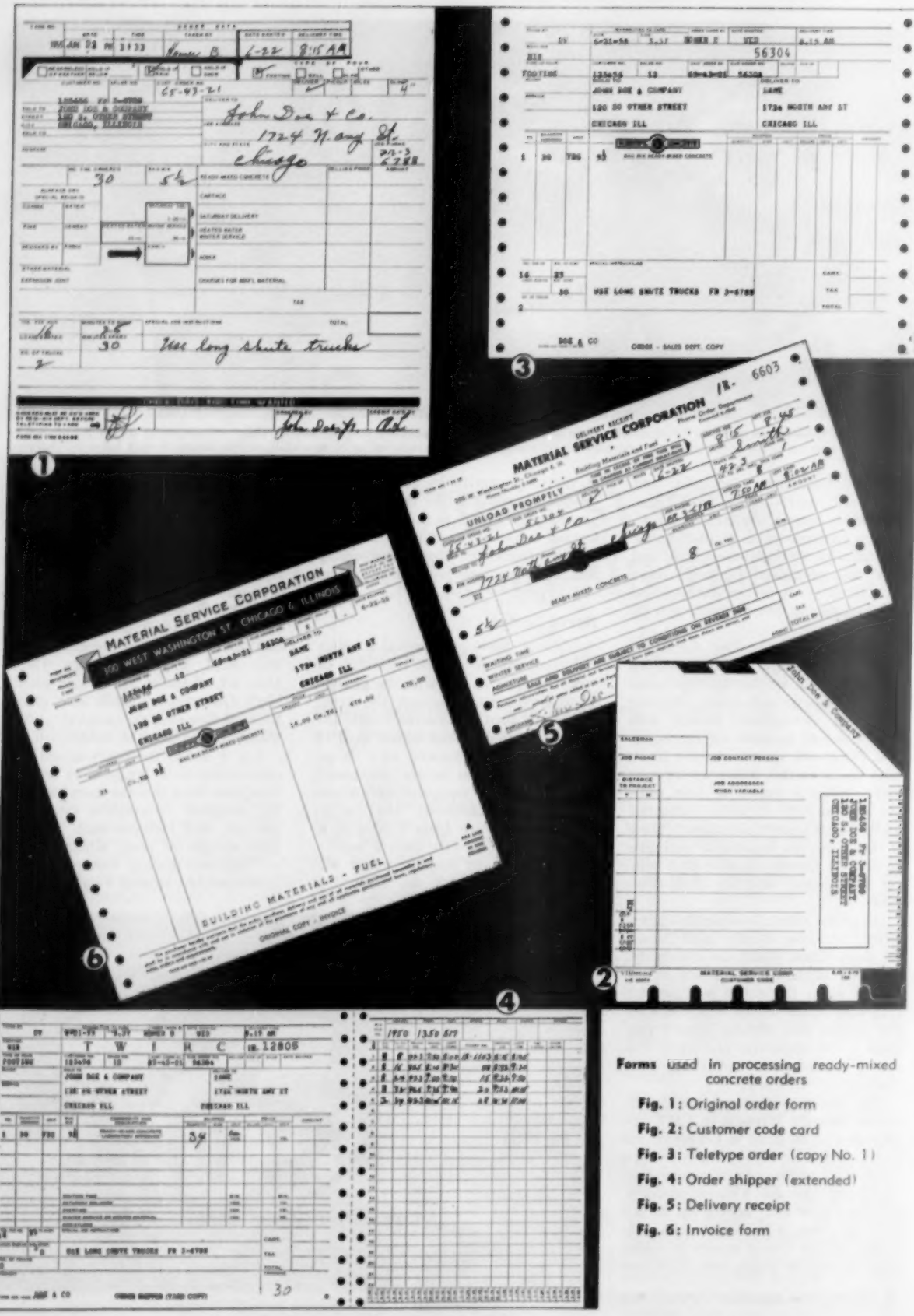
Nerve Center

Material Service maintains a policy requiring that all orders, regardless of size and type of material, be phoned in and processed through the order board and then the teletype room. The order board, operated with a staff of 15 personnel, is located in a large, sound-proof room in the company's main office. It is equipped with fifteen telephone switchboards, one for an order taker. Open from 6:30 a.m. to about 6:30 p.m. (six days a week), the order board handles about 800 orders daily (in May, the daily average was 860), about half of which are for ready-mixed concrete.

After receipt, all material orders (other than ready-mixed concrete) are directed to George Nicholson, in charge of the order board, who clears the order and determines the shipping yard. Ready-mix orders are funneled to a four-man ready-mix section which also determines the shipping yard. This staff includes Maury DeLaMar, who handles north side plants; Herb Greenspahn, south side plants; Richard Conway, an assistant; and Al Vidmar, who lists the orders.

Fig. 1 shows the ready-mixed concrete order form (page 154) used by company. Note that the form has space for complete information relating to the job, and includes such pertinent data as type of pour, whether inside or outside, desired slump, weather contingencies, special weights and ad-

Orders are sent to respective yards by Teletype machines



Forms used in processing ready-mixed concrete orders

Fig. 1: Original order form

Fig. 2: Customer code card

Fig. 3: Teletype order (copy No. 1)

Fig. 4: Order shipper (extended)

Fig. 5: Delivery receipt

Fig. 6: Invoice form

mixes, time of delivery, amount desired per hour, number of trucks, delivery interval, etc.

After clearance, the ready-mixed concrete order is listed accordingly to the specific plant and delivery date. This is an important operation, since orders are often taken as much as a week in advance. Purpose of listing is to maintain a balance between yards and jobs, thereby preventing over-scheduling at any one yard.

Orders to be filled the same or following day are then coded, and teletyped to the specific yard. Four teletype machines are necessary for handling the large volume of orders. The purpose of coding is to enter the official customer name, address, and order number (permanent) on the order, thereby avoiding possible mistakes in later billing. This operation is especially important in a metropolitan area as large as Chicago, where there are numerous similarities and even duplications of company names. For this operation the firm maintains a complete file of customer code cards (Fig. 2). This information is transferred to the order form by means of a Visiriter, a device which eliminates writing or typing. Referring back to Fig. 1, the coded data is seen in the upper left, whereas the address shown on the right is the job address entered by the order taker.

In scheduling jobs, the order board generally selects the closest plant to handle the job, and if the closest plant is overloaded, the second closest plant gets the order. By keeping deliveries as short as possible, minimum cartage costs, higher output, and better service are attained.

The ready-mixed concrete department also schedules the number and size of trucks for each yard each day and the rate of job delivery. Emphasis is placed on maintaining a smooth delivery rate. Knowing as many facts about a particular job as possible enables scheduling to be done accurately. This knowledge is obtained when the order is placed or in some cases by subsequent phone calls.

Truck scheduling is done in conjunction with each yard dispatcher and the central truck dispatcher stationed at Yard 1, headquarters of the ready-mixed concrete operating department. Both the order board and yard dispatcher estimate the number of trucks needed for the following day. If discrepancies occur, adjustments are made through the central truck dispatcher, thus effecting the best possible disposition of trucks. The central truck dispatcher is responsible for seeing that each yard has the proper number of trucks at the beginning of the day's operation.

Central-mix concrete plant at Yard 1, Chicago, which is also headquarters of company's ready-mix operating department. Note radio antenna on top of cement silos

In developing the scheduling operation, the company has adopted certain fundamental principles. For example, first round deliveries are generally confined to short hauls and fast pours; this permits more contractors to be served early in the day. Generally, slab jobs are handled in the morning, and footings and foundations in the afternoon. This is done so that the high salaried cement finishers won't be idle until the concrete arrives. Exception to the above generalization would be a large slow pour with one or two trucks, which requires an early start. Homeowners are generally serviced in late afternoon or on weekends. This delivery regime was worked out after years of experience with the mutual understanding of the contractors.

Fig. 3 shows the first copy of the teletype order, which incorporates all the information obtained from the coded order form shown in Fig. 1. This form is part of a special 8-part order invoice set developed by the company to simplify later billing operations; it makes use of interleaved spot carbon paper and N.C.R. carbonless paper. During initial teletyping, all data on the original copy is duplicated on copy 8, while copies 2 to 7 receive only the common data (i.e., coded company name, address and customer number, delivery address, M.S.C. order number, and quantity bag mix — see Fig. 6). Later, copies 2 to 7 (consisting of carbonless paper) receive the quantity shipped, price per cubic yard, extension, and total bill, the billing data being entered in the

(Continued on page 190)

Each ready mix plant supervisor has two-way radio-equipped car at his disposal. Here Harry Hartler inspects a housing project for road conditions

N.C.M.A. Launches Expanded Research and Technical Program

• Annual convention of National Concrete Masonry Association in New Orleans attracts record attendance for non-exhibit year. Broadened program of service to industry will include national advertising and sales clinics in various cities

S. Carl Smithwick, outgoing president, left, and **Earl W. Peterson,** new N.C.M.A. president

TECHNICAL RESEARCH directed toward quality improvement of its products and new-product development, and strengthening the already high position of concrete masonry as a construction material were given prominence on the program of N.C.M.A.'s 36th annual convention held January 23-25 at New Orleans, La.

The concrete masonry industry had an excellent year in 1955 with sales at a record high of about 2¼ billion 8-in. equivalent units. Growth in acceptance of concrete masonry has been far in the forefront among basic construction materials and the industry has set out to protect its gains through a long-range research and technical program. It is seeking to strengthen customer acceptance for its products by every possible means.

The long range research and technical program which was given overwhelming endorsement by the association membership, in spite of a substantial increase in dues, came in for considerable discussion in one of the sessions. The program is to be started this year. There were papers presented on accelerated drying, high pressure steam curing, the use of fly ash, cracking control, prestressed concrete, competitive materials, etc., all having to do with improvement of product and operations.

The association has embarked on the greatest promotion program in history. Among other subjects covered were public relations, codes, safety, cement supply, one on meeting the competition of poured basements, guaranteed annual wages and the outlook for business ahead.

President S. Carl Smithwick, Portland, Ore., presided for the opening business session when the reports of the association staff were heard and new directors were elected. Presiding officers for the other sessions were Max H. Miller, Wichita, Kans.; W. R. Ireland, Atlanta, Ga.; T. L. Goudvis, Elyria, Ohio; and president-elect Earl W. Peterson, Omaha, Nebr., had the chair for the concluding session.

Entertainment features included a Mardi Gras party, the annual banquet and a post convention trip to Mexico City and Acapulco. Ladies' entertainment comprised a tour of the French Quarter and an afternoon at the races.

Attendance was more than 1400 men and women, with some 450 producer firms represented, which was excellent for a non-exhibit year convention. Delegates from Puerto Rico, Hawaii, Alaska, Korea and the Dominican Republic were asked to rise and be recognized.

Officers

The new officers, elected at the mid-year meeting of the board of directors, were installed at the conclusion of the convention.

Earl W. Peterson, Ideal Cement Stone Co., Omaha, Nebr., succeeds S. Carl Smithwick as president. Mr. Smithwick is now an ex-officio member of the board of directors. Mr. Peterson has been in the industry for 30 years, is also president of the Nebraska Concrete Masonry Association and headed up N.C.M.A.'s accident prevention committee in 1955.

Vice-presidents elected are: Philip Paolella, Plasticrete Corp., Hamden, Conn.; Herbert J. Vincent, Cinder Block, Inc., Detroit, Mich.; and A. R. Waters, Carter-Waters Corp., Kansas City, Mo. Carroll Strohm, Jr., Nash-

Among the speakers were, left to right: Norman H. Withey, technical consultant, Madison, Wis.; Carroll Strohm, Jr., Nashville Breeko Block & Tile Co.; Wm. R. Conners, brick layer's international union representative, and T. L. Goudvis, Concrete Masonry Corp.; and Max H. Miller, United Cement Products Co., and Philip Paolella, Plasticrete Corp.

ville Breeko Block and Tile Co., Nashville, Tenn., was re-elected secretary-treasurer.

New directors elected at New Orleans are W. B. Hovey, Sante Fe, N. M.; Max Miller, Wichita, Kan.; and Franklin L. Williamson, Winter Park, Fla. Other board members include Philip Paolella, Hamden, Conn.; Herbert J. Vincent, Detroit, Mich.; A. R. Waters, Kansas City, Mo.; Jay C. Ehle, Cleveland, Ohio; Ellis E. Jensen, Janesville, Wis.; R. H. Radcliff, Jr., Mobile, Ala.; Ruedy Utiger, Denver, Colo.; Elmer A. Peterson, Ventura, Calif.; and Harvey H. Black, Rochester, N. Y. Walter C. Coupland, Cooksville, Ont., Canada, was elected to the board for a one-year term as Canadian representative.

The convention sessions began with invocation by Reverend A. M. Serex, Rayne Memorial Methodist Church, followed by a welcoming address by Victor H. Schiro, Acting Mayor of New Orleans. Mr. Schiro remarked briefly on the growth of New Orleans and presented gold keys to the city and certificates of citizenship to S. Carl Smithwick, Earl W. Peterson and George W. Katterjohn.

Secretary-treasurer Carroll Strohm, Jr., in presenting his annual treasurer's report, gave a breakdown of expenditures by activity. He was followed by A. R. Waters, chairman of the Budget and Finance Committee, who explained how the budgets are developed.

President's Report

In his annual report, president S. Carl Smithwick, Smithwick Concrete Products, Portland, Ore., gave an excellent summary of the work and accomplishments of N.C.M.A. He also explained the organization of the association, and the functioning of the board of directors and the standing committees for the benefit of newer members and prospective members.

Mr. Smithwick expressed his appreciation for all the cooperation he had had through his term of office and for the N.C.M.A.'s accomplishments in promotion and in technical and research activities. Membership now comprises concrete masonry producers from every state in this country, and from Canada, Alaska, Korea, Hawaii, Japan, New Zealand and South America, according to the speaker.

Mr. Smithwick, in paying respect to his colleagues for their efforts and their willingness to pool their special talents for the benefit of the entire membership, stressed the fact that all officers, board members and committee members pay their own expenses in connection with the many industry meetings and activities held throughout the year.

Recipents of special N.C.M.A. awards for participation in the Civil Defense "Survival City" A-bomb tests at Yucca Flats, left to right: A. G. Streblow, Basalt Rock Co., Inc.; E. A. Peterson, Rocklite Products; Cedric Willson, Texas Industries, Inc.; and B. F. Park, Buildex, Inc. A fifth award winner, South Dakota Lightweight Aggregate Co., Rapid City, S. D., was not present

He was high in his praise for the technical problems committee. Among activities accomplished by that committee, he enumerated development of the Long Range Engineering and Technical Research Program, detailed recommendations on high pressure steam curing, the procedure for a research study on artificial carbonation, and investigations of the bond strength developed between mortar and concrete masonry units.

The association continues to foster the creation and growth of regional or local associations in the interest of close cooperation and collaboration between national and local groups. During 1955, the Nebraska Concrete Products Association was welcomed into N.C.M.A. as an affiliate and as chapter No. 1 of the N.C.M.A. This move made every individual member of the Nebraska group a member of N.C.M.A.

The prevention of accidents, aside from the elimination of human suffering and loss, actually saves participating companies far more money than the cost of dues, he stressed, in summarizing the accomplishments of the accident prevention program.

Mr. Smithwick was gratified that the membership had expressed itself, through a poll, as overwhelmingly in favor of the proposed long range engizeering and technical research program and that such program be started in 1956. This program entails the raising of dues as an investment to secure the industry's position and to increase the acceptance of concrete masonry.

The favorable performance of reinforced lightweight concrete masonry homes in resisting the effects of the atomic bomb explosion at Yucca Flats was given special recognition by Mr. Smithwick. The results of this unprecedented test were widely publicized and gave new stature to the industry. Plaques were presented by N.C.M.A. to representatives of the participating companies, expressing the appreciation of the association to them for their willingness to take such a calculated risk in order to prove the exceptional merits of concrete masonry construction.

The participating companies were Basalt Rock Co., Napa, Calif.; Rocklite Products, Ventura, Calif.; Texas Industries, Inc., Dallas, Texas; Buildex, Inc., Ottawa, Kan.; and Lightweight Aggregates, Inc., Rapid City, S. D.

Cooperative work with other organizations including the Portland Cement Association was summarized. As a result, the P.C.A. will soon release a sound film in technicolor exclusively on concrete masonry, for public viewing.

In closing, Mr. Smithwick told how past president Fred Reinhold, Buffalo,

New N.C.M.A. directors, left to right: F. L. Williamson, Holloway Concrete Products Co., Inc., Winter Park, Fla.; W. B. Hovey, Hovey Concrete Products Co., Inc., Santa Fe, N. M.; and Max H. Miller, United Cement Products Co., Wichita, Kan.

Herbert H. Moniz, Honolulu Construction & Draying Co., Ltd., Hawaii, and **A. G. Streblow,** Basalt Rock Co.

N. Y., had taken out a $15,000 life insurance policy on himself naming N.C.M.A. as beneficiary.

Engineering Report

Director of engineering R. E. Copeland summarized research and engineering accomplishments and outlined contemplated projects. The current level of spending for these activities has been about 20 percent of total outlay by the association, but is scheduled for substantial increases starting in 1956 with development of the long range program.

One of the major research projects of extreme importance that has just been completed is concerned with the evaluation of shrinkage test methods, in recognition of the fact that specifications are becoming more rigid with respect to shrinkage. No standard methods for testing shrinkage have yet been devised, and a method was sought that might be reproducible.

Under this program, supervised by the N.C.M.A. technical staff and conducted by Prof. Saxer at Toledo University, tests have been conducted using plant-manufactured units of five different aggregates, both high- and low-pressure steam curing, rapid drying, etc., to develop comparative data. Results of this work will soon be provided the membership.

Work has also been underway involving sound absorption and carbonation tests. The sound absorption tests in the Armour research laboratories have included different types of block and paints of various types.

Carbonation studies are to determine if artificial carbonation in manufacturing units may not free masonry walls, when laid of such units, of natural carbonation as a contributing factor to long-time shrinkage.

The Portland Cement Association is doing basic research on carbonation and N.C.M.A. is concentrating on the economics of carbonation. Tests thus-far run have indicated that such processed units have less shrinkage than those un-treated but artificial carbonation is too costly. The diversion of stack gases, from curing operations, and their use for carbonation is under study.

Mr. Copeland itemized the technical reports and bulletins put out in 1955. Among the technical reports were a manual on the layout and design for high pressure steam curing, and reports on accelerated drying of units at temperatures above 240 deg. F., the effect of curing methods on the properties of concrete units, including tensile and elastic data, the investigation of structural properties of masonry in walls, beams and columns, and sound absorption properties.

A number of technical bulletins were prepared to answer specific questions on subjects like mix design, gradation of aggregates and many others.

Among developments in specifications is the recommended change to C 15 of A.S.T.M. on manufactured units which would lower permissable shrinkage. If this is approved, it will be necessary to set up standard test methods and limits for shrinkage. Mr. Copeland believes the recommendation is likely to pass. A measure for moisture control based on the relative humidity method is being considered as a tentative standard. Also there is possibility of adoption of freezing and thawing requirements for aggregates which would be entirely new.

Mr. Copeland told of work being done relating to building codes and with the many outside associations and government organizations of importance to the industry. In 1955, there was a revision to the national building code of Fire Underwriters establishing more severe standards for thickness of fire and party walls. Considerable field investigation of cracking of masonry construction was done in 1955 and there will be more such work done in the future.

Report on Promotion

The association undertook its greatest publicity campaign in history in 1955, and is launching a program of many facets to aid member companies to do a more effective selling job.

Director of promotion W. P. Markert summarized the 1955 program and outlined future plans. A considerable national advertising program is underway in home magazines and in architectural, builders and technical magazines to put over the advantages of concrete masonry construction.

Slides were used to illustrate many of the advertisements run. Acoustical properties, fire safety, association research, the use of masonry for school, church, motel and other classes of construction, new applications of exposed masonry, economies and other features and advantages are being stressed to the appropriate audiences.

Aside from advertising, the program includes supplying sales tools and aids for selling. Circulation of "Pictorial" was increased to 20,000 copies in 1955. A new publication, "Principles of Warm Air Heating," was published in 1955 for use in promoting concrete masonry floor systems. The booklet, "Facts About Concrete Masonry," is being revised. An 8-page brochure was put out on the Yucca Flats atomic bomb test.

Because of the growing demands for supplying photographs, a folder with 70 excellent photographs has been made available for members at cost.

A series of sales and merchandising conferences is to be started. The first will be held in Chicago to be followed by conferences in four other cities. Among objectives will be to show producers how to use advertisements and other selling aids in their selling programs and to teach how to sell the architect.

According to Mr. Markert, the editors of home magazines and others are becoming more aware of the concrete masonry industry, with the result that favorable publicity is growing. There will soon be an article in *Coronet* magazine on swimming pool construction of concrete masonry. A 12-page article in the March issue of *House and Home* will play up the use of masonry to the builder. Other articles are in process.

Mr. Markert showed a newly-developed "recessed" concrete unit to illustrate how concrete units lend themselves to unlimited architectural effects. This particular unit with an 8- x 16-in. face had a ⅜-in. recess extending from each lower corner on a diagonal to the upper edge (on both ends) $3\frac{3}{8}$ in. in from both ends when laid in a wall. A diamond effect was created that was very attractive as shown by colored slides of walls laid with such units. Such a unit would be very economical to make with standard machines, he said.

Washington Office Activities

The concrete masonry industry has gained in stature among government agencies in Washington, D. C. over the past few years, according to Theodore Leba, Jr., manager of the Washington office. Whereas, a few years ago, concrete masonry had little standing in the nation's capital and was on the defense, he said that the industry's ad-

(Continued on page 160)

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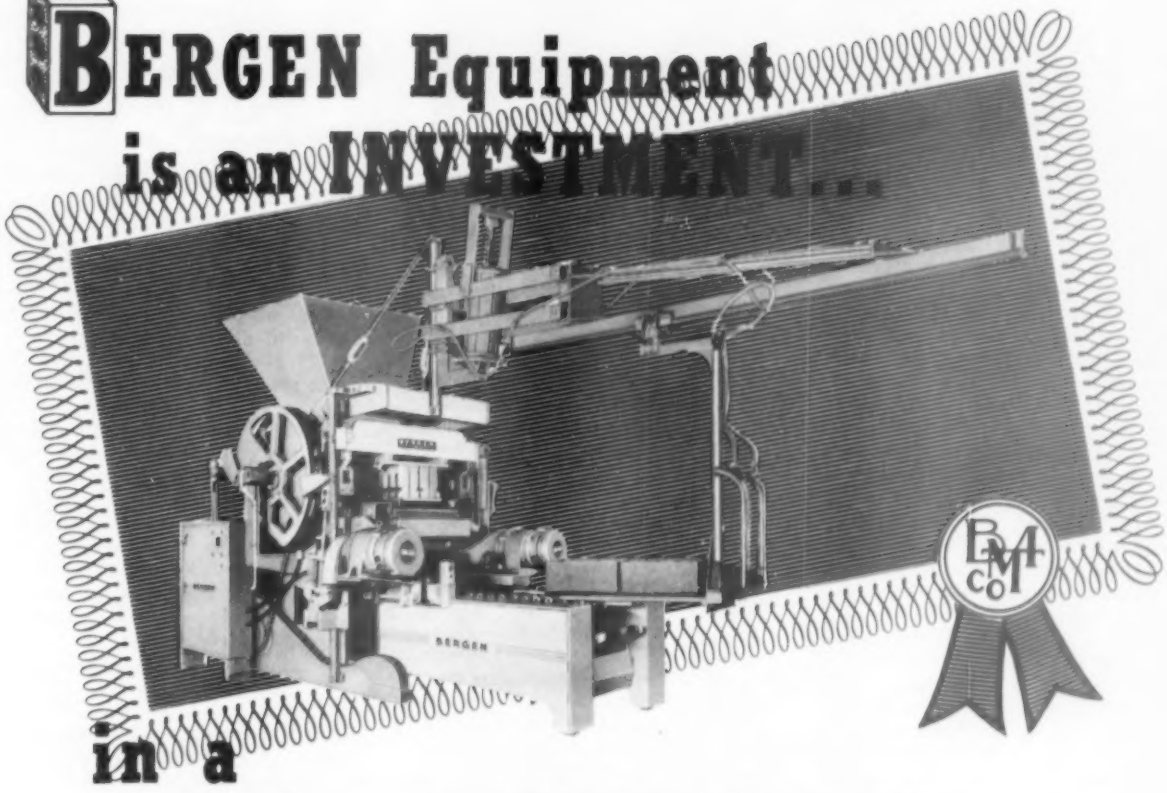

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vice and help is now being actively sought.

During 1955, Mr. Leba was asked by the Corps of Engineers to conduct a seminar at its district offices in the interpretation of Bureau of Standards requirements (3079) for concrete masonry construction. He conducted a series of 26 lectures which were attended by some 700 architects, engineers and specification writers. The reason for these talks was for the development of uniformity in standards for the construction by the military of barracks, officer quarters and other structures. Now, concrete masonry is on an equal basis for such work with competitive materials.

One of the functions of the Washington office is to review drafts of specifications for masonry. Through such work, the industry is now in a position to promote split block as an alternate to jumbo clay units and tile-faced units as an alternate to clay tile structural units. Technical advice on concrete masonry construction for use in seismic areas is supplied.

Work is continuing with the F.H.A. and V.A. The one-piece chimney block and single cap block earned F.H.A. approval in 1955. The industry protested and was successful in having a proposed new restrictive heat transmission standard reversed by F.H.A. Efforts are being made to have bond beams and solid masonry approved, as effective as poured concrete, for termite construction.

The industry has set up a 135-ft. wall consisting of panels of units made from different aggregates and laid up in different patterns and finishes, as part of a permanent exhibit of building materials in Washington. Much time is spent by the Washington office in servicing requests for information.

Public Relations

The essence of an excellent talk by Edgar Forio, vice-president, Coca-Cola Co., Atlanta, Ga., was that everybody in a business is in the public relations department. He stressed that a business needs friends like it needs customers and that public relations stems from a management concept that interprets the personality of the business. Public relations was defined as a policy that reflects throughout the organization's employes.

Friends are important, he emphasized, reminding that every business is but one generation removed from oblivion. He mentioned how certain companies once nationally known have gone out of business because they failed in building and keeping friends.

He emphasized the importance of keeping the promises of advertising and of removing weaknesses in the business. A business, he said, must earn respect through effort and must perform a community service.

Kun Woo Choy, Korea Building Materials Co., Ltd., Seoul, Korea, and **Geo. W. Katterjohn,** Katterjohn Concrete Products Co.

Cement Supply

In a talk "The Cement Shortage in the Block Industry—Fact or Fancy?", Wm. M. Avery, editor, *Concrete* magazine, reported the findings of a survey questionnaire made of the block industry late last year. The findings were based on replies from about 300 producers or about half of the N.C.M.A. membership; these companies produced 460,000,000 block in 1955, or an estimated 20 percent of the total United States output.

The main conclusion was that although many producers were seriously affected by cement shortages, the industry as a whole was better off than previous reports had indicated. According to the survey, total output would have been increased by less than 5 percent if the supply of portland cement had been adequate. This gain would have accounted for perhaps as much as 110 million units, the speaker said, or roughly 110,000 units per firm reporting. On an area basis the estimated production loss averaged 190,000 units per plant in the midwest, 150,000 in the southwest, 80,000 in the east, 47,000 in the southeast, and only 15,000 in the far west.

The speaker reported that 36 percent of the producers replying experienced some loss of production due to the cement shortage, and 37 percent said the shortage was worse in 1955 than in previous years. In terms of areas, 55 percent of the midwestern firms, 50 percent of the southwestern, 24 percent of the eastern and southeastern, and 11 percent of the western firms reported some loss of output due to cement shortages.

In spite of the shortages, the block industry produced an estimated 2.2 billion 8-in. equivalent units in 1955, an increase of 14 percent over 1954, Mr. Avery stated. Production gains ranged from 12 percent in the east and far west to 18 percent in the southeast.

Other findings showed that out-of-area cement and foreign cement purchases accounted for about 4 percent of total cement consumption by the block industry. Percentages varied from over 7½ in the southwest and east to less than 1 in the far west.

Among practices followed by block producers to alleviate the cement supply problem were the following: dealing with several cement suppliers rather than one or two; maintaining closer ties with cement suppliers and notifying them of requirements as far in advance as possible; using such concrete additives as fly ash; installing additional cement storage facilities; building up large block inventories during off season; and holding down the opening of new accounts. Some producers even reported interchange of cement with competitors.

Concerning the future cement supply, Mr. Avery estimated that cement output will probably be increased by at least 20,000,000 bbl. in 1956, due to the large expansion programs underway by the cement industry. If the block industry receives its proportionate share of this added output (the share is roughly 7 percent of the total output, he estimated), this will mean enough cement to increase block output by about 140,000,000 units. Since this increase is roughly only about half the increased production in 1955 as compared to 1954, the cement supply outlook for 1956 isn't too encouraging, he concluded.

New Block Masonry System

A new system of block masonry laid without mortar, but strongly bonded by grout, was described by Philip Paolella, Plasticrete Corp., Hamden, Conn., in a talk entitled "An Approach to Meeting Competition of Poured Basements." In New England, he said, poured basements have come into wide use during the past decade, due to lower costs of construction when compared to concrete masonry foundations.

The new system, developed during the past two years by Plasticrete in cooperation with the United Research and Development Corp., New Britain, Conn., is referred to as Groutwall. According to Mr. Paolella, comparative foundation costs per sq. ft. without parging or waterproofing in his area are as follows: 8-in. Groutwall, 45-55¢; poured concrete, 50-60¢; and

(Continued on page 163)

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CONTINUED ON NEXT PAGE ...

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many of these cost-saving, profit-making developments are common to most truck mixers today, others are still exclusive on Rex machines. But, as history repeats itself, you will find that these profit making features, too, will become a standard of the industry.

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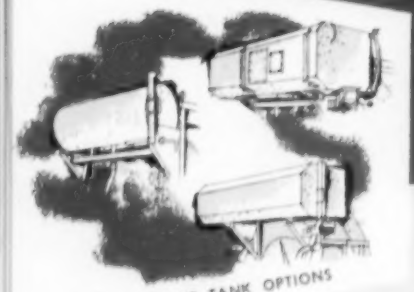
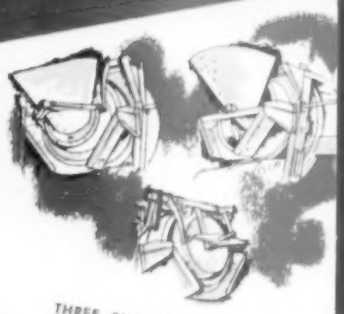
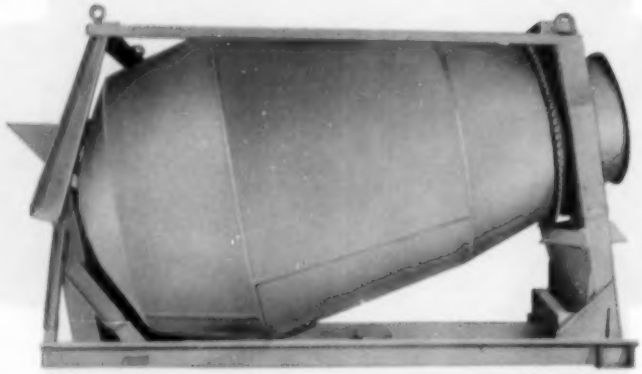


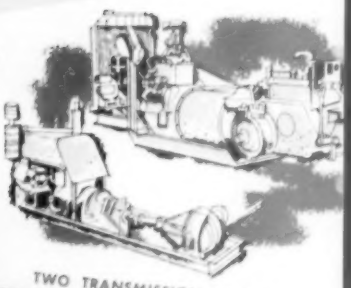
THREE WATER TANK OPTIONS



THREE CHARGING OPTIONS



TWO WATER SYSTEM OPTIONS



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Litho in U.S.A.

N.C.M.A. Convention

(Continued from page 160)

12-in. masonry walls, 60-70¢. The new system means a savings of $50 in a basement comprising 1000 sq. ft.

The Groutwall block is an 8- x 8- x 16-in. three-core hollow unit with a solid top and an open channel on the bottom; it can be made with either light or heavyweight aggregate, the former being preferred due to weight. An 8-in. Groutwall block weighs 36 lb. compared to 30 lb. for a cinder block. After curing, the block are ground on a dual wheel horizontal grinding machine, which yields an absolutely parallel top and bottom, accurate to within .005 in.

In constructing the wall, the first course is laid in conventional mortar, the course being keyed to the footing or to the floor slab. Care must be taken by the mason to make each block in the first course perfectly level (i.e., both lengthwise and crosswise), since succeeding courses parallel the first. The second course is then laid dry; and a very wet cement grout (1:3 cement sand mix with 10 gal. of water per sack) is poured into the vertical groove of the block, using either a pail or ladle-type trowel. Because it is only necessary to use sufficient grout to fill the bottom channel, each succeeding course is laid and grouted separately. Using excess grout is wasteful and costly, the speaker indicated. At window jambs and on the last course, the solid (top) portion of the block over the cores is pierced with a hammer and the entire core space grouted; in the case of the last course, this permits insertion of anchor bolts at any location. After erection, the inside surface can be either finished with a cement washcoat or parge coat and the outside surface waterproofed with a cement parge coat or a bituminous asphalt coat or both.

To prove the structural soundness of Groutwall to F.H.A., V.A. and public building officials, the company constructed test walls for comparing 8-in. Groutwall with a 12-in. block wall and an 8-in. block wall having 8-in. pilasters on 12-ft. centers. The various test walls were built to form a 4 ft. wide by 8 ft. deep by 24 ft. long tank, which was gradually filled with water until the wall collapsed. Using water as a backfilling media rather than soil meant a safety factor of 2, since water has twice the density of soil, the speaker stated. Tests revealed that the 8-in. Groutwall were stronger than the two other type walls, the groutwall failing at a water depth of 6½ to 7⅓ ft., the other types at about 5 ft. Compression tests of the cement grout were also made, and these indicated a strength of 4000 p.s.i. compared to 500 to 1000 p.s.i. for ordinary mortar.

The Groutwall system is currently being studied by government officials, and acceptance is expected by the company in the near future, Mr. Paolella stated. Besides competing in the foundation wall market, the speaker felt that Groutwall may even compete with prefabricated walls and tilt-up construction.

Guaranteed Annual Wage

"The Significance of the Guaranteed Annual Wage Negotiations in 1955" was the title of a thought-provoking paper given by Lee C. Shaw, lawyer, Seyfarth, Shaw & Fairweather, Chicago, Ill. Mr. Shaw said that recent G.A.W. negotiations have demonstrated the definite shift in power from management to labor in bargaining. He emphasized that this development represents an invasion of the legislative function of state governments by private bargaining groups; in this respect it is different from any preceding type of bargaining. To counteract this trend, he urged the people to exert pressure in order to keep the power of unemployment compensation in the state. He felt that the matter would only be settled through public opinion.

As background for his talk, Mr. Shaw outlined the major developments in labor-management negotiations, beginning with the Wagner Act in 1935 and ending with the G.A.W. plan for the automotive industry last year. During this period the number of union employes grew from 3,000,000 to over 17,000,000. He also pointed out that some 200 guaranteed plans were in existence prior to the Ford plan, but these involved only a small percentage of employes compared to the present day.

The speaker also outlined the history of unemployment compensation, making reference to both the subsistence and status theories. He said that present state plans follow the subsistence type, granting modest compensation payments in order to tide the unemployed person over the jobless period.

The Ford plan, on the other hand, provides compensation well above the subsistence level. This is dangerous, he said, because past experience has shown that malingering is fostered by granting high compensation payments over long periods of time. The net result is the program becoming a dole, placing heavy tax burdens on the people. This happened in Britain after World War I, he said, and almost led to bankruptcy. The problem was solved there by reverting to the original subsistence-type unemployment compensation first adopted in 1911. Mr. Shaw felt that we would be faced with a similar problem if the G.A.W. trend continues. The only difference would be that our problem would be generated by private policy rather than government policy as in the case of Britain.

In conclusion Mr. Shaw believed that the G.A.W. plan will spread in the future. He predicted that the plan would first engulf such large industries as steel and metal working and eventually envelope the smaller crafts.

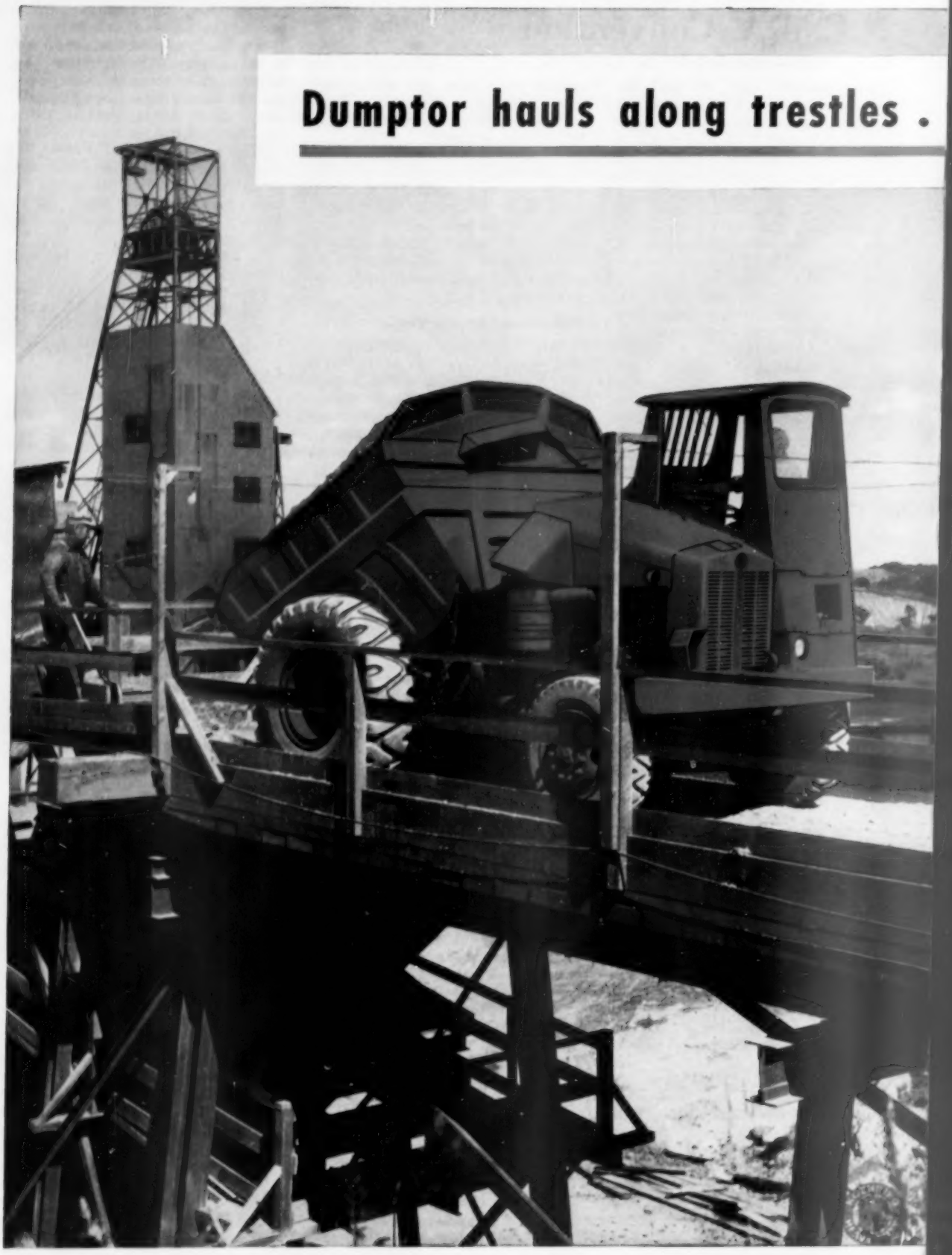
Construction Record

In a talk entitled "As the Nation Grows, It Builds," Thomas S. Holden, vice-chairman, F. W. Dodge Corp., New York, N. Y., pointed out that new construction was at a record high of $42¼ billion in 1955, would probably exceed $44 billion in 1956, and may reach $55 billion by 1965. He based the latter prediction on the assumption that the Gross National Product is expected to exceed $500 billion and possibly approach $550 billion by 1965 (in 1955 it was $398 billion) and that the construction volume would continue to account for about 10 percent of the G.N.P. (since 1950 the percentage has varied from 9 to 11). He also predicted a $15 billion repair construction market by 1965.

The speaker attributed the nation's strength and bright outlook to such factors as our rapidly expanding population, productive capacity and production; our mature, flexible money and credit system; and various economic stabilizers. He stated that our population is growing 2,700,000 annually, and is expected to reach 193,000,000 by 1965. Since 1939 our productive capacity and G.N.P. have more than doubled; and overall production has increased 2½ times, with mineral production up 79 percent, farm output up 30 percent, and construction volume increased by three times. He referred to the development of many new products, growing diversity of demand, and expanding research activity as stabilizers in our economy. Mr. Holden also cited the new attitude of business to plan expansion programs based upon the long range view rather than on next year's sales. For example, General Motors Corp. has announced plans to spend $1 billion on expansion, yet 1956 car sales are expected to drop off from

(Continued on page 167)

Dumptor hauls along trestles .



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Nine material weigh-dials on the control panel have individual pen-recorders. Exact weight of each batch is automatically graph-recorded. Johnson transit-mix plant shown here has: six 5000-lb. aggregate batchers (two with automatic moisture-compensators) . . . a 3000-lb. cement batcher with dual fill valves for selecting 2 types of cement . . . a 2000-lb. water weigh-batcher, and a 5-lb. (80-oz.) air entraining admix batcher. All are fully automatic.

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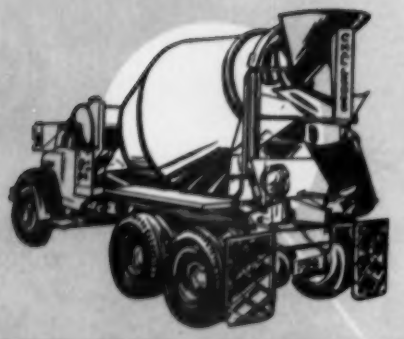

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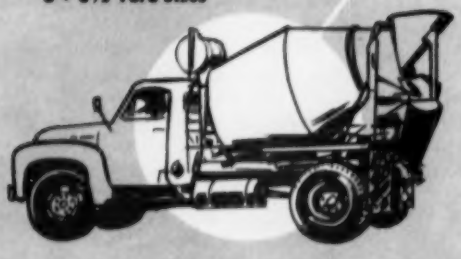

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N.C.M.A. CONVENTION

(Continued from page 163)

the record 1955. These factors, he said, tend to "breed confidence in the nation's economy."

Concerning the construction market, Mr. Holden emphasized the tremendous backlog for all types of construction. He indicated that housing starts are expected to drop off slightly in 1956 (to 1,200,000 units) but that the dollar volume will be only slightly decreased due to higher building costs and the trend to larger, more expensive housing.

At the session presided over by W. R. Ireland, Atlanta Aggregates Co., Inc., Atlanta, Ga., a U. S. Chamber of Commerce film "People, Products and Progress: 1975" was shown. This film predicted what life would be like in the United States in 1975. The forecasts in the film were based on studies made by a group of industrial firms and trade associations, among which was the Portland Cement Association. As evidenced by the film, the rock products industries will continue to play a large and growing part in the nation's economy.

Wm. R. Conners, first vice-president, Bricklayers, Masons and Plasterers International Union, Washington, D. C., spoke on "Concrete Masonry's Part in the National Building Program." Mr. Connor's main concern seemed to be about the use of metal clad building units, or metal panel-type construction, and he said that thin steel construction costs from $3 to $15 per sq. ft. compared to $1.40 to $4.00 for masonry. He reported a survey made by his organization relating to thin steel construction and found that after examining 639 buildings 38 percent had been infiltered by air, 24 percent by water, 11 percent by snow, and 25 percent by dust. The interiors in many cases were covered with moisture or vapor and many of the walls were pitted and rusted. The speaker also stated that metal clad buildings were expensive to maintain and that the wind had loosened panels in some instances, thereby creating a serious safety hazard to people on the street level below.

The speaker also discussed his organization's efforts in raising the standards of mason workmanship, and of a contest for apprentices in that field. Worthwhile prizes are given to the contest winners, and this has been a factor in attracting young men into the masonry field. Mr. Conners urged the membership to take an active part in this contest.

RESEARCH PROGRAM

T. L. Goudvis, Concrete Masonry Corp., Elyria, Ohio, reviewed "N.C.M.A.'s Long-Range Research and Technical Program." Mr. Goudvis is chairman of the technical problems committee. The sub-committee on long range planning and engineering and technical research had submitted a proposed long range program on this subject. The proposal previously had been subjected to a vote including a questionnaire, and it appears that about 90 percent voted in favor of the plan. In essence, it consists of a five year, step-by-step plan to provide much needed technical information relating to a large group of important problems faced by the concrete block industry. Cracking is one of these problems. Other goals sought are to improve product quality, improve use performance, develop new uses and new products, and to reduce manufacturing and construction costs. The end result of such a program, coupled with wider promotion and sales work, would mean wider public acceptance of concrete block.

The plan embraces a gradual enlargement of the engineering and technical staff. There are at present two engineers under the director of engineering. Under the 5-year plan, this would be increased to four the first year, then progressively six, seven, and nine, along with other laboratory and secretarial help. The present budget embraces $60,000. Under the proposed plan the yearly budgets would be increased to $85,000 the first year, then $102,000, $127,000, and $152,000. The plan also includes setting aside a yearly additional sinking fund with which to build a research laboratory.

Clayton Rand, editor, author, Gulfport, Miss., gave an entertaining, informative, and inspirational address "Mixing Concrete With Dreams."

Regional Building Codes

M. L. Clement, director, Southern Building Code Congress, Birmingham, Ala., in a talk, "Regional Building Codes and Their Influence on the Technical Requirements of Concrete Masonry," discussed the impact of regional building codes on code practices and urged that producers take an active interest in such codes.

Until 1946, he said, when the N.C.M.A. began to work on codes, there was little to help the industry

(Continued on page 168)

because its products were not included in building codes. In fact, he said, that there was no difference specified between solid block and the present accepted unit.

Mr. Clement gave much credit to N.C.M.A. for gaining recognition for concrete masonry units in codes and for development of codes based upon facts. He expressed the hope that the association will actively keep working on regional codes, since they are of utmost importance in creating markets. The importance of technical research and market research was stressed as of utmost importance.

Prestressed Masonry Floors

Operations of one of the nation's most successful producers of prestressed concrete masonry were described in an illustrated talk, "Developing a Profitable Market for Prestressed Concrete Masonry Floors," by Carroll Strohm, Jr., Nashville Breeko Block and Tile Co., Nashville, Tenn.

This company has built a sizable volume of business through producing prestressed concrete bridges, poured channel slabs, spandrels, purlins, beams and prestressed joist and filler block systems. It was the first to build a prestressed block bridge in the United States and is producing county and state bridges. Machine-made units are used for the purpose and the company built its own fabricating bed.

Poured channel slabs are the biggest seller, for spans up to 65 ft. for roofs. Having such units available has been instrumental in greatly increasing sales of conventional masonry units. Expanded shale and slag aggregates are used.

A large market for small industrial and commercial buildings is being developed, and advertising and promotion are being concentrated to develop those markets. Advertising stresses the speed, economy and availability of prestressed concrete.

The company had a sales volume of five million 8-in. equivalent masonry units in 1955 and prestressed products represented 45 percent of total dollar sales volume. The plant has a capacity to produce 4000 sq. ft. of channel slabs per day.

Mr. Strohm's talk was largely illustrated by slides showing manufacture and by job pictures showing erection of the various types of units.

High Pressure Curing

Cedric Willson, Texas Industries, Inc., Dallas, Texas, gave a well prepared and comprehensive report on the "Economic Considerations in the Selection of High Pressure Steam Curing Systems." His report was built around two types of high pressure steam curing systems, both hypothetical. He named one system a "One-Phase System" and the other a "Two-Phase System." In the first system, the block are placed on racks in the high pressure vessel; and in the two-phase system, the block are partly cured in a holding room, then cubed and placed in the autoclaves. The hypothetical plants would be two-machine units, operating two shifts for five days; each machine would have an output of 850 units per hour. For the one-phase system, the speaker said, four autoclaves would be needed, and he selected 104-in. dia. pressure vessels, 120-ft. long. Installation and operating costs were also discussed. The conclusion was that a one-phase system would cost considerably more than the two-phase system, but lower operating costs of the one-phase system would pay out the increase in a few years of operation.

R. E. Copeland, director of engineering, N.C.M.A., presented a paper on "A Rational Approach to the Control of Cracking." Using slides, Mr. Copeland outlined engineering and technical data that could be used as a rational approach to the problem. Expansion joints, distribution of stresses, and location and frequencies of reinforcing were discussed. The slides were replete with complex algebraic formula that have been developed for an N.C.M.A. manual to be published soon.

Use of Fly Ash

In an illustrated talk "Use of Fly Ash in Block Mixes," Norman H. Withey, technical consultant, Madison, Wis., pointed out that the temperature at which concrete block are cured is an important factor influencing the amount of fly ash that can be used in a mix without suffering a strength reduction. In fact, he said, tests show that increased strengths can result when optimum amounts of fly ash are used in conjunction with elevated curing temperatures (e.g., above 160 deg. F.) or with high pressure curing. Other advantages of fly ash cited besides the pozzolanic action include increased early age toughness (which reflects in less breakage during handling), better mold life, better corners, and improved finish and texture.

Mr. Withey first described a series of strength and toughness tests recently conducted by Prof. G. W. Washa at the University of Wisconsin Materials Laboratory involving 2- x 2- x 16-in. prisms of block-type concrete. He also presented test data on 8- x 8- x 16-in. units made with fly ash in various midwestern commercial plants, as well as data from Prof. O. Neil Olson's 1949 report for N.C.M.A. relating to effects of various admixtures on block strength.

In Professor Washa's experiments, the prisms were made on a vibrating table and cured under low pressure at 120, 130, 160, and 190 deg. F. and under high pressure at 350 deg. F. Fly ash, obtained from Chicago Fly Ash Co., was used in the following percentages; 0, 14, 25, and 40 by weight of cement plus fly ash. The batch weights of sand and gravel remained constant for all the mixes.

One day flexural strengths were practically identical at 120, 130, and 160 deg. F. with 0, 14, and 25 percent fly ash; but at 190 deg. F. there was a marked strength increase of the prisms containing 14 and 25 percent fly ash. This indicates a critical temperature above 160 deg. F. when pozzolanic action is accelerated, he said. Forty percent fly ash appeared to be too high, since e.g., at 130 deg.

(Continued on page 171)

N.C.M.A. 1955 safety awards were presented by Henry Quaritius, right, of Nailable Cinder Block Corp. Left to right: Hamilton Lott, Palmetto Quarries Co. (class B); R. E. Sheer, The Geist Builders Supply Co., (class A); and W. A. Carter, Sr., Fischer Lime & Cement Co. (class C)

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Why are the leaders choosing RCA 2-Way Radio?

They are impressed by RCA's fine nation-wide factory service organization and the years of RCA leadership in radio and electronics. Look for these marks of quality: Superior crystals, tubes and microphones for plainer talking, longer operation . . . heavy gauge steel case for rugged service . . . color-coded tuning for simplest maintenance . . . expert service by RCA Service Company to assure peak performance.

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- Contractors are in direct communication with our ten plants, supervisors and engineers. Guesswork is eliminated and everybody is operating more efficiently.
- Service on truck breakdowns has been so speeded by radio that contractors are seldom delayed. If a plant has a temporary bottleneck or is overloaded with work, trucks may be shuttled between yards with maximum efficiency.
- Completely engineered RCA installation provides excellent coverage despite Cincinnati's famous hills. More than 100 vehicles in fleet are RCA radio-equipped.

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☐ Please send me complete information on the use of 2-Way Radio.
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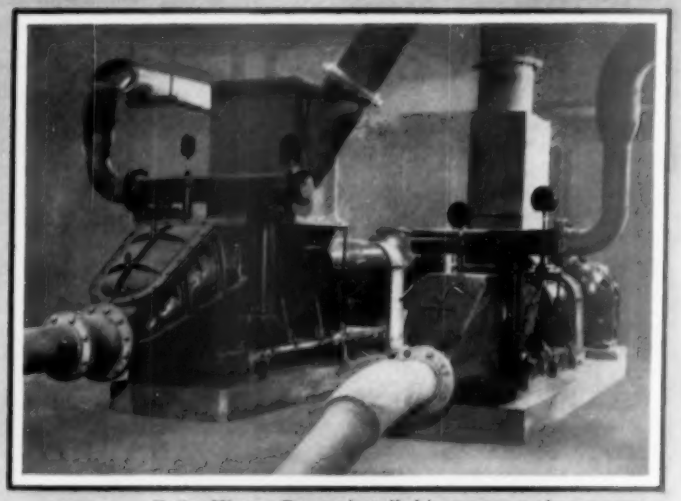


Fuller-Kinyon Pumps installed in a cement plant conveying finished Portland Cement and cement raw materials.

What's the Best Way

to move dry, pulverized materials

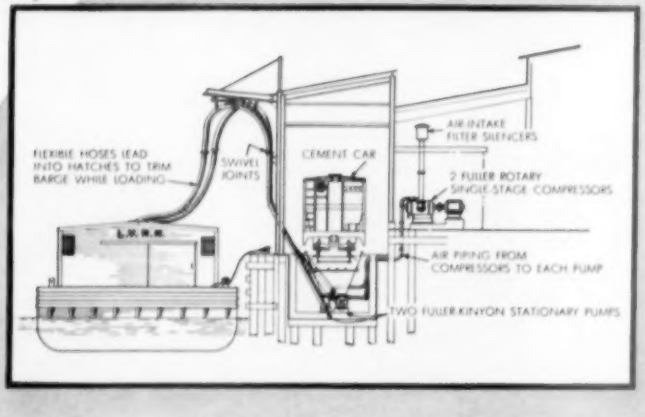
From HERE to THERE?

Unquestionably, the best way is the way that keeps production highest and costs lowest in any plant where bulk-material handling is a basic production factor.

"Here," may be cars, trucks, ships, barges, grinding mills or storage—"there," may be packer bins, process, cars, trucks, ships or barges. If your operation involves loading, handling, unloading or all three, the Fuller-Kinyon System assures that full capacity will be maintained over the maximum conveying distance. Air does the work—safely, cleanly, efficiently. And it's versatile—you can use Fuller-Kinyon anywhere a pipeline can be run, and depending upon your requirements, it is available for remote or automatically controlled operation.

If you are presently conveying dry, pulverized materials into, through, or out of your plant, get the full story on Fuller-Kinyon—harnessing air to move materials. It costs you nothing and may well pay you plenty in terms of higher, sustained production at reduced cost. Write today for Bulletin FK-26A.

Fuller-Kinyon system transferring Portland cement from hopper-bottom cars to barges at rate of 1000 barrels an hour.


FLEXIBLE HOSES LEAD INTO HATCHES TO TRIM BARGE WHILE LOADING
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N.C.M.A. CONVENTION

(Continued from page 168)

F. the strength was actually reduced. High pressure curing produced a slight strength increase in plain concrete, but a very decided increase when the fly ash was increased to 14 and 25 percent.

Regarding specimens at 22 and 28 days age, the increase in strength of the prisms made with 14 and 25 per cent fly ash and cured at 190 deg. F. was not nearly so great as at 1 day, the speaker remarked, thus indicating that the effect of the higher curing temperature is largely an acceleration in pozzolanic strength development. The tests also indicated that with the plain concrete mixes, there was no advantage of curing at a temperature above 120 deg. F.; also that 40 percent fly ash was too much with the mixes used in the test.

Toughness (or energy at rupture) values of the specimens were determined at age 1 day and at 22 or 28 days; this value represents the total area under the load-deflection curve and is expressed in thousandths of inch-pounds per cubic inch. A low value indicates brittleness or ease in breaking the specimen. Mr. Withey pointed out that the toughness values somewhat parallel the flexural strength values. Thus, without fly ash, at age 1 day, the toughness values for 120 to 190 deg. F. curing are very similar; but with 14 and 25 percent fly ash, a marked increase in toughness was apparent when the temperature was raised to 190 deg. F. Again 40 percent appeared to be beyond the peak so far as fly ash quantity is concerned; however, at 190 deg. F., there is no reduction in toughness as there is when 40 percent fly ash is used in curing at 130 deg. F.

In referring to Prof. Olson's report, the speaker quoted one test on both cinder and sand and gravel block made with fly ash and cured at 160 deg. F. Results at 3, 28 and 120 days showed that up to 20 percent fly ash could be used with satisfactory results.

Mr. Withey also cited more current trial block tests made at six midwestern plants, involving light and heavyweight units and low and high pressure curing. The following data was obtained at one plant making heavy block. It is to be noted that the strength tests are averages of two or three blocks, usually taken from separate successive batches.

Tests of Heavy Block*

Chicago Fly Ash, Percent by Weight	0	19	19	25	25
Chicago Fly Ash, Pounds	0	75	75	100	100
Cement, Pounds	400	325	325	300	300
Torpedo Sand, Pounds	3400	3400	3300	3400	3300
Gravel, Pounds	1000	1000	1100	1000	1100
Compressive Strength at 2½ months, p.s.i.	1075	1240	1475	1400	1465

*Maximum curing temperature approximately 172 deg. F.

Note that the strength was raised substantially with both 19 and 25 percent fly ash. The increase was slightly greater when the sand was reduced 100 lb. and the gravel increased 100 lb. Mr. Withey indicated that this can be done without resulting in a coarser texture because of the high fineness of fly ash and the greater plasticity.

Results of tests of block made with limestone at another plant are as follows:

Tests of Heavy Block*

Chicago Fly Ash, Percent by Weight	0	20	20
Chicago Fly Ash, Pounds	0	100	100
Cement, Pounds	500	400	400
Fine Limestone, Pounds	3500	3500	3400
Limestone Chips, Pounds	500	500	600
Compressive Strength at			
7 days, p.s.i.	728	774	1003
28 days, p.s.i.	754	817	1054

*Maximum curing temperature approximately 170 deg. F.

Results of still another test, but involving high pressure curing are shown below:

Tests of Lightweight Block*

Chicago Fly Ash, Percent by Weight	12	37	50	47	57
Chicago Fly Ash, Pounds	50	160	215	200	240
Cement, Pounds	380	250	215	200	120
Lime, Pounds	0	20	0	30	60
Fine Slag, Pounds	2115	2015	2015	2015	2000
Coarse Slag, Pounds	250	300	300	300	325
Compressive Strength, p.s.i.	605	614	884	985	797

*High pressure steam curing, 150 p.s.i.

This case, he said, gives some idea of what might be accomplished with autoclaving, although it did not cover the field of possible concrete mix combinations.

In conclusion, Mr. Withey emphasized that trials must be made in the plant before the optimum percentage of fly ash can be determined; this is due to variations in the type and grading of aggregates, cement, curing procedure, etc. In addition, the type of fly ash is a factor. He indicated that with low pressure curing, from 15 to 30 percent fly ash is generally used; and with high pressure curing, the fly ash content may run as high as 50 percent.

Panel On Drying

A convention highlight was the panel on "Accelerated Drying Facilities, Methods, and Costs." Participants included Benjamin Wilk, moderator, Standard Building Products Co., Detroit, Mich.; Verne Frese, Layrite Concrete Products of Seattle, Inc., Seattle, Wash.; and Ralph Reiner, Cleveland Builders Supply Co., Cleveland, Ohio. Each panelist, using slides, described his company's facilities for meeting the 30 percent moisture specification.

Mr. Wilk's plant incorporates two drying rooms, each measuring 15 ft. high by 18 ft. wide by 55 ft. long; each room accommodates 87 cubes, or about 7000 units. The block are arranged in loose cubes, three high, while the concrete brick are dried on racks. A completely automatic oil-fired furnace supplies air at 300 deg. F.; the air enters through ceiling ducts, three to a room, and leaves through a floor duct at the rear of each room, returning to the furnace. Exhaust temperature is about 200 deg. F. Fuel consumption was reported at 5 gal. (No. 2 oil) per 1000 brick dried (in summer), or about 75¢ per 1000 brick, in winter, about $1 per 1000 brick. Mr. Wilk expects to cut the fuel cost in half this spring by converting to gas firing. He reported that the drying facilities, built in 1941, cost about $20,000; if built today, the cost would be doubled, he stated.

Mr. Frese prefaced his talk with a brief discussion of the relationship between block shrinkage and drying. He felt that using dry air only creates an unsatisfactory skin dry condition. To overcome this condition, his company uses a Campion Accelerator, the heated air being blown through a water spray for a 30-min. period before entering the drying kilns. Then the heated air alone is blown through the kilns and returned via ductwork to the Accelerator for recirculation. With this method, vapor pressure builds up in the center of the block, forcing the moisture out, he said.

The company uses three 9- x 50-ft. kilns for drying, each holding 3000 units. The block are cubed on wooden pallets, and moved to the drying room after two or more days of outside curing.

The drying cycle is 11 hr. for expanded shale block and 72 hr. for pumice block, the operating costs being about 1¢ and 3¢ per unit, respectively. Fuel oil and butane have been used, but the company expects to convert to gas firing shortly. Mr. Frese indicated that the cost for equipment of a drying system of this type is about $1500 per kiln, which is not too expensive.

(Continued on page 188)

They're swapping minutes for dollars!

Worthington MIXERAMA proves on your job that a Hi-Up Mixer earns more for you!

You're looking at the unique new truck mixer demonstration that's got the Ready-Mix industry buzzing!

Hundreds of Ready-Mix men are finding out at MIXERAMA that no other truck mixer is in the same league with the Worthington Hi-Up. MIXERAMA is an eye-opening exhibition of Hi-Up performance — *and you see it at work right on your own job!*

Sure, we're proud of the Hi-Up Mixer. So proud, in fact, that we make a special point at MIXERAMA of letting you do just about anything to the Hi-Up that strikes your fancy. Try out the clutch . . . swing out (or on!) the sturdy discharge chute . . . climb *inside* the drum (of the Cutaway Mixer)— we want you to see for yourself just why we say the Hi-Up Mixer is your best buy . . . why no other mixer is in the same league when it comes to delivering *more uniformly mixed* concrete *faster!*

Tell your Worthington distributor you want to see MIXERAMA, with a Hi-Up loading at your plant and then delivering concrete to your current job. Or watch MIXERAMA in your area—your distributor will set up the date. It's the most convincing demonstration you've ever seen. And it's staged under operating conditions that *you* select . . . the tougher, the better! Call your Worthington distributor today and tell him you want to see MIXERAMA right away.

The Whittemore Co. watched MIXERAMA ... then bought Five Worthington Hi-Ups!

Whittemore Co. V.P. says, "I've never seen a more sensational demonstration — nor a better truck mixer than Hi-Up"

Mr. A. Lovetere knows truck mixers inside out, knows from years of experience what kind of performance they *must* deliver to pay off for him.

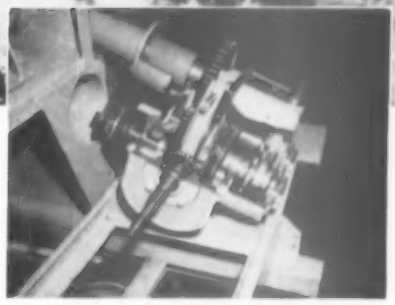
Just recently he attended a Worthington MIXERAMA. As he says, "There's no better way to find out what a Worthington Hi-Up Truck Mixer can really do. And what I saw sold me completely on Worthington.

I also learned that one of the basic reasons for Hi-Up performance is Worthington's big research program on concrete mixing. They've built their research findings right into the Hi-Up design—and you can see the results in the quality of concrete it delivers.

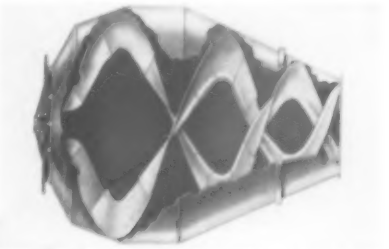
Every man in this business ought to see a MIXERAMA demonstration—it certainly opened *my* eyes. For me, there's no better truck mixer than the Hi-Up."

Be next in line!

See the Hi-Up in MIXERAMA or see it at your Worthington distributor. Worthington Corporation, Concrete Machinery Division, Section R.6.1A, Plainfield, New Jersey.



Toughest transmission built today. No adaptation of commercial unit, it's *designed* for mixer use. Single-lever operation for easy control from either end.



Beating this drum is impossible! Drum and blades are made of abrasion-resistant steel. Blade design gives thorough mixing, fast discharge. Advanced water system for precision mixing.

MIXERAMA'S on the way to you!

WORTHINGTON

If It's a Construction Job, It's a Worthington *Job*

V-Belts • QD Sheaves • Air Compressors • Air Tools • De-Watering Pumps • Truck Mixers

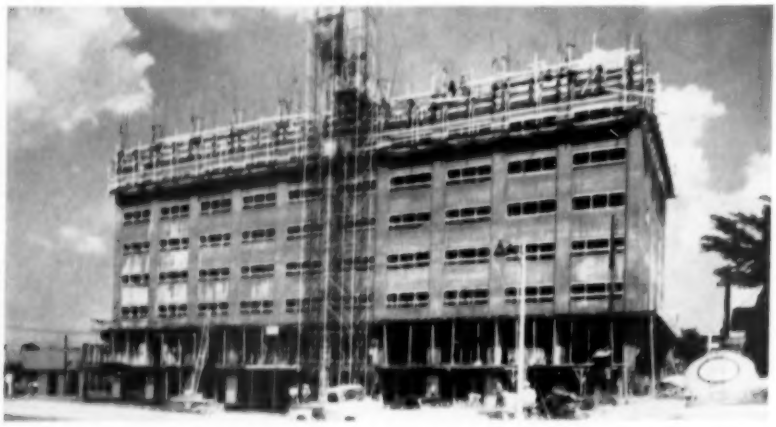
THREE 50-MAN CREWS, working around the clock, placed the reinforcing, placed and tamped concrete, set windows and doors.

Apartment building poured with slip-forms in 114 hours

THE SLIP-FORM METHOD so successfully used on silos and grain elevators worked equally well on this 10-story apartment building. Because the basement and two lower floors are designed for open parking, they were built by conventional methods. The exterior walls, corridor walls and partition walls for the upper 8 stories were then erected by one continuous pour to slip-forms, completed in 113 hours and 55 minutes. The roof slab was poured next and the floors were then poured from the top down.

A continuous 150' x 30' platform supported the wood slip-forms, which were 36" deep and of 7½" inner width. Hydraulic jacks raised platform and forms at a rate that began at 9" and eventually reached almost 30" an hour.

Success required the accurately scheduled and uninterrupted delivery of 2100 cubic yards of concrete having the closely controlled strength and slump needed to support successive layers while still damp enough to allow all forms to slip under jacking pressure. This requirement was met by using ready mixed concrete, processed in truck mixers of certified design, capacity, mixing speed and water control accuracy.



Madison Towers, Memphis, Tennessee. John H. Doggett, architect; S. S. Kenworthy, engineer; Southern Builders, Inc., contractor.

Truck mixers delivered to 1½-yard bucket in double well elevator.

You have a right to insist on this Rating Plate. It certifies compliance with the high industrial standards maintained for your protection by the Truck Mixer Manufacturers Bureau.

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One of the many Barber-Greene BatchOmatic Asphalt Plants setting new low cost production records in the United States and Canada.

Now . . . two, four and six thousand pound Barber-Greene BatchOmatic plants

Less than a year ago Barber-Greene introduced the revolutionary BatchOmatic—the first plant ever designed from its original conception for completely automatic operation. In that short time the success of this batch plant has been established all over the United States and Canada. Owners and operators everywhere report that the automatic operation has reduced their costs, increased production and expanded their market. Inspectors find that the BatchOmatic consistently produces mixes to specification with automatic accuracy.

Now the Barber-Greene BatchOmatic is available in three sizes: two, four and six thousand pounds.

Now you can choose the capacity that best meets your needs and get the money-making design features that lead the field . . .

Simultaneous weighing of all sizes of aggregate . . . to eliminate the human element in achieving accuracy and maximum capacity.

Instant change-over from automatic to manual operation . . . to provide mixes for the drive-in trade . . . instantly reset to preset repetitive cycle operation.

New Dyna-Mix pugmill . . . to give more thorough coating in less time than any other pugmill.

Instant, positive inspection of aggregate gradation and weight.

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Write for your copy of "Principles of the BatchOmatic"—clearly illustrated

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CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

PLANT MAINTENANCE

By JAS. A. NICHOLSON*

39. A producer views the ready-mixed concrete business. This is the second article on plant maintenance

WHEN READY-MIXED CONCRETE OPERATIONS expand to the point where a producer cannot handle all the principal management duties, key employes come into the picture. In such a situation, the supervision of plant maintenance most likely becomes the responsibility of the operations manager. This same top line employe is also generally responsible for the operation and care of delivery equipment.

The chief duties of an operations manager (or equipment superintendent) as to plant equipment, include maintenance of present plant facilities, study and improvement of existing plants, consideration of operational changes (e.g., study of a pilot installation of an additive dispenser to determine the feasibility of its general adaptation), design and installation of new plant facilities, and direct supervision over all plant personnel, including plant men, crane operators, and maintenance crew.

Always a principal task of a manager in his handling of plant maintenance problems is his preparation of a schedule for major repairs and overhauls. One such winter schedule at our Toledo plants called for the building and installation of a new bin and weigh batcher at our dock operation. building of a new plant in southwest Toledo, changing of material scales at our Rossford operation, installation of new blades in two plant mixers, and consideration of new slump and moisture determinants.

This schedule spelled out specific jobs that were to be undertaken at our plants during an approaching annual winter slow-down period. Work was so arranged that only one of four plants was to be down at a time, and also planned to fit into our winter vacation program for plant employes.

The kind of maintenance work to be undertaken can be shown by listing specific jobs planned for two plants:—

(1) At our dock operation, provision was made to replace the receiving hopper and install new chain and buckets in the cement elevator of the big storage bin; rebuild wash rack; tighten center pin and overhaul engine in crane; rebuild and hardface mixing blades of plant mixer; and install a new aggregate bin and weigh batcher.

(2) A listing of maintenance work scheduled for our Fitch Road operation included relining of weigh hopper, installing bin flow units in cement bins, replacing ring gear on crane, devising improved grease seals for cement elevator, providing new batcher support rods, and replacing worn float valve of water tank with a new hydra motor valve.

This particular maintenance schedule included recommendations providing for standardization of water charging procedures at the different plant mixers. The operation manager's report listed replacement parts that would have to be purchased and gave the approximate date that this equipment would be required. This same report also included a section dealing with the manager's opinion on the individual abilities of the plant employes and a recommendation covering several changes in their duties.

The submission of the maintenance schedule report was followed by a group meeting of all concerned key employes. By the time this meeting was held, we had a good idea when required replacement parts would be available. A principal topic of consideration was the great variation between different plant men in operation and maintenance procedures. More uniform lubrication and service routines were adopted. Better housekeeping was stressed. Discussion of employe efficiency later led to several reprimands and to one dismissal.

For each plant operation, a schedule of repairs and overhauls was carefully worked out. In line with concrete delivery commitments, plans were formulated to close down each plant for a specified number of days. Work at certain plants was deferred until replacement parts would be available. Winter work on mixer trucks was adjusted to correlate with plant maintenance schedules.

This maintenance meeting developed some practical suggestions:—

(1) Equipment superintendent, plant men, and maintenance crew made to realize the importance of regular inspections. When men are alert, a regular program of preventive maintenance can be carried out and completed without interference with service commitments.

(2) Lines of communication must be kept open—responsible key employe must be notified when plant operator senses impending trouble. As other small maintenance jobs should be completed when plant is down temporarily for repairs, this required work must be promptly brought to the superintendent's attention.

(3) A multiple plant producer should standardize on plant equipment. A smaller stock of replacement parts will be required, similar operating practices and maintenance procedures can be adopted, and plant men can be interchanged more easily.

(4) An efficient operator sees to it that plant men are properly trained to operate and maintain equipment entrusted to their care. Unquestionably, considerable maintenance work and downtime are caused by improper handling of equipment.

(5) Major repairs and overhauls require the use of proper tools and availability of materials and parts. Our study developed the fact that too many maintenance jobs were being handled in a hit and miss manner, resulting in prolonged downtime. It was pointed out that a job of tearing down an engine could be done more efficiently if the right kind of wrenches and other tools were available to the mechanics. It was agreed not to start a job until satisfied that necessary replacement parts, materials, and tools were on hand.

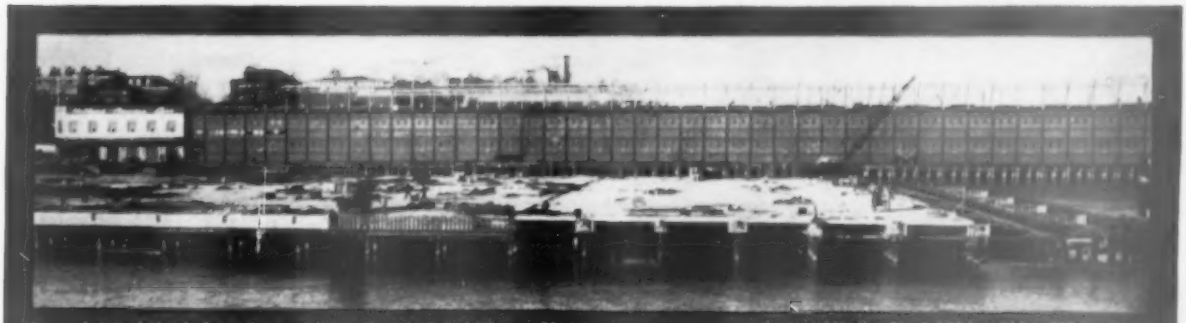
(6) A concrete plant should be carefully checked before the start of any major job. Any operating weakness that might cause downtime should be corrected. Cement and aggregate scales should be thoroughly checked as should water and additive measuring devices. The whole plant should be given a good housecleaning. The cooperation of a new job inspector is more easily secured when the whole plant is in first class order. Nothing is more damaging to the producer on a big job than the occurrence of an unnecessary, avoidable plant breakdown.

This meeting and other similar dis-

*Nicholson Concrete Co., Toledo, Ohio

ANOTHER PRESTRESSED CONCRETE PIER

for The Port of New York Authority



General view of pier deck nearing completion. Post-tensioned pile caps 21'-6" on centers are supported on steel H piles. Pier is 323 feet wide x 702 feet long.

Pulling 320-foot length of Roebling strand from barge-mounted reel into pile cap forms. Strand was delivered encased in flexible metal hose and with fittings attached ready for placement in forms.

Tensioning a strand while standing in railroad well. Use of single long-stroke center-hole ram and threaded connections cuts jacking time to minimum.

IT IS INTERESTING to recall that prestressed concrete was specified as an *alternate* to more conventional designs for Pier C. The results of that project were so satisfactory that prestressed concrete alone was specified for the new Pier A at Hoboken, N. J.

Roebling Tensioning Elements were used for pre-tensioning the deck stringers on both piers, and for post-tensioning the pile caps at Pier A. Several factors led to the choice of Roebling Strand Assemblies for the pile caps:

★ Machine fabricated strands permitted larger units and reduced the number of tensioning elements handled on the job;

★ For units exposed to tide action, Galvanized Strand Assemblies provided corrosion resistance while curing and minimized friction while tensioning.

★ 320-ft. assemblies complete with metal hose and fittings could be pulled into the forms (with stirrups in place) in 15 minutes;

★ Quick and easy tensioning with a standard center hole ram and threaded connections permitted supervision by regular personnel without need for specialists.

Precast stringers on the new pier, 5 ft. wide x 1 ft. deep and spanning between pile caps 21'—6" on centers, were pretensioned with over 400 miles of Roebling ⅜" 7-wire Uncoated Stress-Relieved Prestressed Concrete Strand.

Linear prestressing in America was initiated by Roebling. In fact, after two years of development and tests, Roebling assumed the role of "guinea pig" in 1946 and placed a prestressed concrete floor in its new Chicago warehouse.

Today, as the result of continuous development and participation in all types of prestressed projects, Roebling is the foremost supplier of tensioning materials in the industry. Why not ask the most dependable source for suggestions and advice on specific applications? Write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.

Pier A was designed by Parsons, Brinckerhoff, Hall and Macdonald for The Port of New York Authority. Erection including stringer fabrication, by J. Rich Steers, Incorporated.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

cussions helped to make us realize that if plant equipment is to be properly operated and maintained, some one key employe is going to have to do a lot of straight thinking, careful planning, and efficient supervising.

Aggregate Handling Equipment

REMARKS previously made on operation and care of cement elevators apply generally in a consideration of aggregate elevators. Because parts of this unit suffer faster wear than those on the cement elevator, this equipment requires more regular inspection, lubrication, and other servicing. One major difference in these similar pieces of equipment is that on the aggregate elevator, the power drive is placed at the top of the unit while the motor is at the bottom of the cement elevator.

Aggregate Elevator

The necessity of going up to the top for frequent lubricating and servicing is one of the major objections to the use of an elevator in raising aggregate to overhead storage. Even if a safety ladder is provided, many plant men object seriously to this climb. Because of this difficulty with plant personnel, coupled with excessive downtime experience, we have discontinued the use of aggregate elevators at our own operations, but this method of elevating aggregates to overhead storage continues to be employed at many ready-mixed concrete plants. The requirements that the power drive be at the top is always an added problem, both as to maintenance and safety.

On some bucket elevators, belting is used instead of chain. Recommendations that will be made below, covering belt conveyor operation, apply when belting replaces elevator chain. When belting is used instead of chain, a major maintenance routine is to regularly make certain that all buckets are securely fastened to the belting.

Belt Conveyor Maintenance

The belt conveyor, with proper maintenance practices, is an efficient, low cost piece of equipment for elevating aggregates to overhead bin from a receiving hopper or from stockpile. In the construction and operation of receiving hopper and stockpile facilities, care should be taken that materials are handled with a minimum of segregation, grinding, breakage, and intermingling.

At a modern, pushbutton plant that I visited recently, conditions around the aggregate receiving hopper were far from what is expected at a quality minded plant. Hopper bottoms were not sufficiently angled; wet sand and pea gravel were not cleaning out completely. At one dumping of aggregate, a full load of 1½-in. top size gravel was thrown on top of several tons of pea gravel still in the hopper. At least one customer was certain to get a poor load of concrete. Even though an operation is comparatively trouble-free, management should regularly check on operating and maintenance practices.

Manufacturers' instructions should be closely followed in the installation, operation, and maintenance of the belt conveyor system. In purchasing a new conveyor, only proven equipment should be considered. Stay away from a "price deal" and "too steep an angle." Provide accurate foundations so that there will be no settling of supports. Install a scraper just past the discharge point to keep the underside of the belt clean. See to it that extra idlers support the belt in the loading zone area. Arrange the belt loading setup in such manner that the aggregates are chuted in the same direction as the belt is moving. Provide sufficient clearance between the bottom of the chute and the surface of the belt. Use pieces of old belting to prevent spillage over the sides of the moving belt. It is good thinking to protect the conveyor with an inclined cover.

The use of an aggregate conveyor requires that careful, continuing attention be given to belting, fasteners, idlers, bearings, and shaft alignment. Hold one employe responsible for regular checking to make certain that idlers are turning freely at all times, minor cuts in belting are promptly repaired, belt fasteners are free of breakage, belting isn't running over the edge of the pulleys, take-up is in proper adjustment, belting is protected against oil and grease, and that all other adjustments and repairs necessary to keep the conveyor system in top working order are performed as required.

Crane Care

Many ready-mixed concrete producers use a crane equipped with a long boom and a material handling bucket. A crane may be used for stockpiling, charging a material hopper, or to elevate aggregates to overhead storage. Crane operation is dangerous. Even where a producer provides a completely adequate piece of equipment and takes every precaution as to boom and cable reliability, employes should be kept out of the danger zone. Booms and buckets fall for one reason or another. We've had an experience wherein one of our best employes was seriously crippled. We hope that no similar incident ever again mars our operating record.

Proper maintenance of a crane is of vital importance. The crane is an expensive piece of equipment. Replacement parts cost real money. Engine or gear downtime is a costly experience. In an annual slow period, this unit should be reconditioned that trouble-free operation can be expected for the season ahead.

At our plants, we operate a number of cranes. We hold each individual crane operator primarily responsible for the operating condition of his unit. He is held accountable for regular (daily and weekly) inspection and lubrication and for the safety condition of boom and cable. We have learned that dependence on an operator is not always a sufficient precautionary measure. Our equipment superintendent and plant maintenance employes are also given responsibilities. Whenever they visit a plant, they are told to give operating cranes a "once over" and to talk to the operator about his crane's operating condition. On each visit, we expect them to always check booms and cables. They are on the lookout for danger signs that might lead to downtime or accidents.

Where cranes are used at an efficient ready-mixed concrete operation, the condition of booms and cables are closely scrutinized at regularly established periods. In boom inspection, responsible employes are on the look out for mis-alignment, bent bracing, cracks, and loose welds. Whenever a bucket comes back into a boom, boom strikes a corner of a bin, or the boom in any way gets rough treatment, an operator should lower the boom and make a careful examination of its whole length. It is fundamental that an operator never take a chance on either a weakened or improperly supported boom.

Operating efficiency is lessened and there may be danger in getting a stick too straight up to reach a material bin or to keep a bucket from striking bin sides and corners. No booms should be lengthened beyond the recommendation of the crane manufacturers or their service engineers. Extension of boom length almost automatically calls for use of additional counter weights. Lowering the boom to increase area of operation is another

"Demand for our 'Columbia Block' has been so great that it has forced us into a two-shift, 14-hour production day"

says Adrien Roy, President-Treasurer,
Manufacture des Produits Dunbrik, Port-au-Prince, Haiti

ADRIEN ROY, President and Treasurer of Dunbrik.

Dunbrik's Columbia machine in full operation.

Main building of the Sanitorium of Port-au-Prince, built by the "Derat" construction company with Dunbrik material.

"Regular monthly production of 150,000 8x8x16 *(or equivalent)* blocks".

"First quality block".

"Low initial cost".

"Low maintenance and repair cost".

"Easy handling and operation".

"These are a few of the reasons why we are deeply satisfied with your machine," says Adrien Roy. He further states: "The continuous high production of our Columbia machine has made us Haiti's leading manufacturer of concrete blocks."

Storeroom and offices of the O.A.C.A., second section of Magloire, Port-au-Prince, Haiti, W. I.

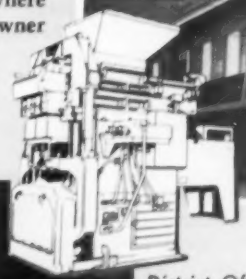
Apartments, located in Bois-Patate, were built by the Derat Construction Company.

Columbia's MODEL 8
Fully Automatic Block Machine

This Columbia machine — like the machine purchased more than two years ago by M. Roy — can give *you* the same profit-earning benefits . . . the same competitive advantages, whether you're doing business in Indianapolis or India.

There's a Columbia machine in operation somewhere near you. Inspect it for yourself, and ask the owner how its performance measures up!

For prompt information on Columbia's complete line of fine block-making machinery and equipment — write, phone or wire . . .



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District Offices in: Wisconsin, Illinois, South Carolina, Mississippi, Florida, New Jersey, Virginia, California, Massachusetts, Montreal, Quebec, and Vancouver, B. C.

dangerous practice that should never be attempted without manufacturer's approval.

Cranes equipped with a material bucket for handling aggregate require four separate cables:—(1) boom cable; (2) closing line; (3) holding line; and (4) tag line. From the viewpoint of safety, the condition of the boom and closing cables is most important. Unless the crane is correctly operated and properly maintained, cable replacement costs can sharply rise. In the face of faulty operation or care, the purchase of new cable is not an answer to the problem. Improper operation (e.g., carrying a loose holding line) may quickly lead to a cut cable. Worn guides on point sheaves (top of boom) will cause rapid wear and broken strands. Wear is generally greatest where the cable goes through the bucket sheaves. New or old, cables with broken strands should be promptly replaced and the cause of the trouble corrected.

A cable longer than required should always be bought for the closing line of a crane bucket operation. Buying a longer cable permits the operator to cut off 6 to 10 ft. when the cable begins to show wear at the bucket sheave and still use the cable in the same position. Then if, as expected, the line again shows wear around the bucket sheave, the cable should be taken completely off, the cable reversed, and the worn end wrapped around the drum. Whenever employes notice wear in the bucket sheave reeving, cutting off the worn part of the line or reversing the cable in time are preventive maintenance procedures.

Determined by its use, an average operating life should be worked out for each of the four cables. If a cable needs replacing before its average expectancy, steps should be taken to ascertain the cause, and correct the trouble.

Care of Material Handling Buckets

A material handling bucket is considerably lighter than a clamshell digging bucket of the same capacity. The material bucket is not quite as rugged in construction. Never intended to serve in the function of a headache ball, it should not be used to break up hardened concrete. Its job is to move aggregate. In this capacity alone, it will be exposed to plenty of wear. The bucket handles gritty, abrasive materials. Even twice daily lubrication does not always suffice. The bucket gets a lot of banging around. It is apt to have a short operating life. Its useful life is likely to be so short that the cost of a new bucket should either be expensed or, at the most, written off in two operating years.

From its beginning use, a material bucket should be lubricated both in the morning and afternoon of each operating day. It is imperative that the closely fitted bearings be protected with an adequate film of grease. Almost from the start, the bucket should be regularly checked for wear and other damage. After a bucket is properly broken in, an inspection should accompany the twice daily lubrication.

A new material handling bucket costs several thousand dollars and wear starts almost immediately. When a main shaft or bushings show wear, they should be replaced. If worn bushings aren't promptly replaced, the castings will be worn and new bushings will never fit correctly. Bucket lips should be regularly examined for wear. When a bucket starts to drip materials, it may be possible to build up and hardface the old lips. If wear has gone too far, new lip sections will have to be installed.

At each bucket lubrication, the holding line socket should be given an application of heavy motor oil. At each lubrication, this socket should be checked for wear. This is an important safety measure, for the holding line supports the entire weight of the load during the dumping operation. Similar attention must be given the closing line socket and wedge; in lifting, the closing line carries the load.

At least once a month all sheaves should be regularly checked. Worn bushings or bearings should be replaced. At this checking, sheave grooves should be given attention. If grooves are of improper depth, cables will show faster wear. This checking is done with a groove gauge. When wear interferes with proper fitting of cable, the old sheaves should be machined or new ones installed.

Nowhere in a ready-mixed concrete plant is daily care more important than in maintenance of material handling buckets.

All moving parts of a crane should be regularly inspected and lubricated. A record (e.g. wall chart) should be kept on all maintenance services. Listings should be made of oil and filter changes, checks on bands, air-cleaner, spark plugs, points, etc. on engine tune-up and cleaning. Engine operating hours should be noted. Without proper record keeping, necessary maintenance work will be deferred until engine starts acting up, gear teeth break off, or other troubles develop.

In care of crane equipment, northern operators face additional hazards (e.g., something is almost certain to break if a crane is moved before all assemblies are thoroughly thawed out). The use of winter grade lubricants and oil is an added consideration. Daily checks should be made of thermostats, fan belts, battery, generator, voltage regulator, starting motor, and all electrical connections. Radiator and hose connections should be checked for leaks; the use of antifreeze becomes necessary.

During each and every operating day, a crane should get regular systematic attention.

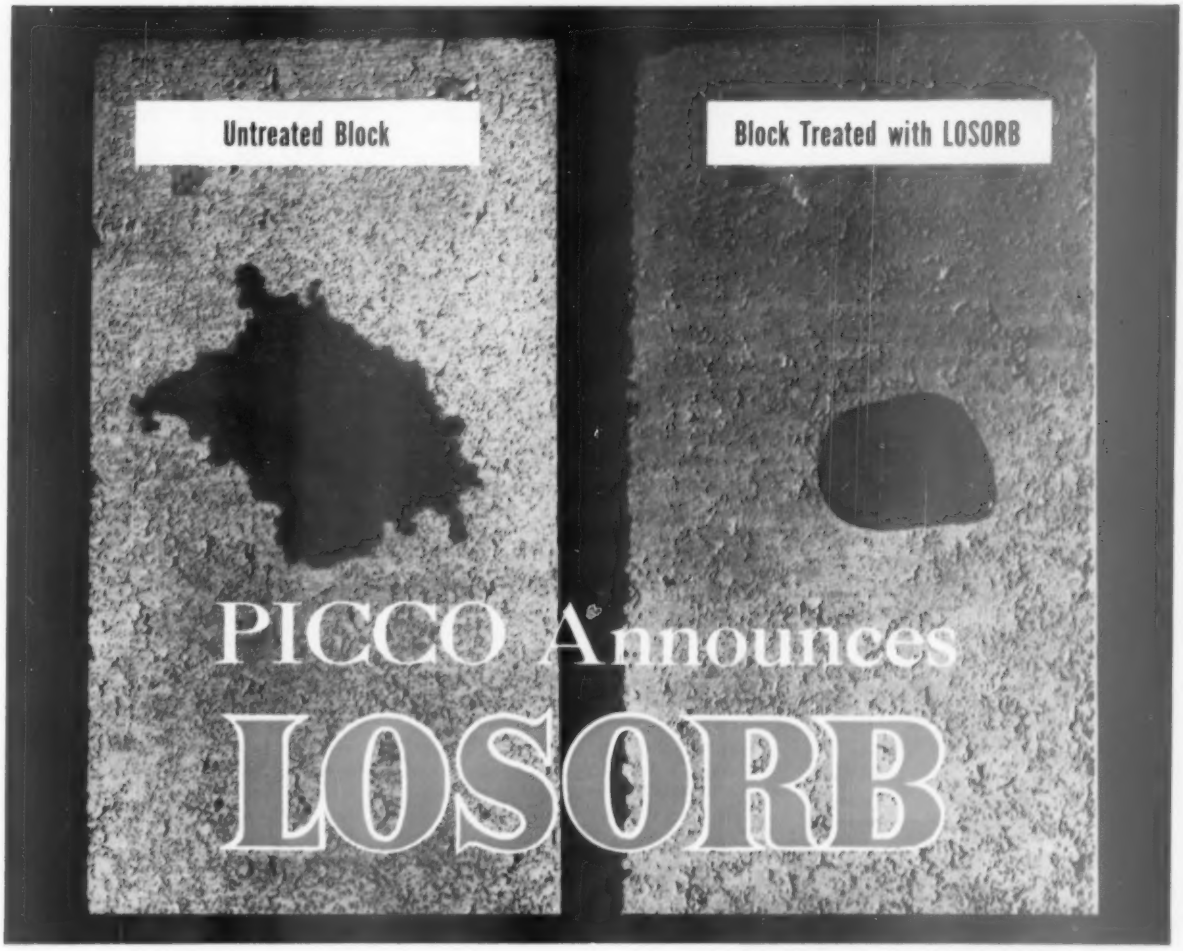
Weighing Hoppers and Scales

IN PREVIOUS ARTICLES, the requirements of an adequate weigh hopper have been discussed. At this time, it should be sufficient to say that a weigh hopper should be of rugged construction, cylindrical in shape, or built with curved corners, bottom section so slanted to prevent any hanging up of materials and large enough to weigh out in one "shot" the biggest load that a truck mixer can adequately handle. In a batching plant, the hopper and feed chute should be so constructed that materials are ribbon fed into the truck mixer. The weigh hopper should be connected to its scale through a rugged, friction free, dependable lever system.

Any producer considering the erection of a new plant facility should provide a separate weigh hopper and scale for cement handling. Many specifications now make this a plant requirement. Furthermore, it is uneconomical and somewhat dangerous (possibility of insufficient quantity of cement in a given batch) to weigh cement and aggregates on the same scale.

As to equipment, a beam scale is a minimum requirement. This scale should have a separate beam and poise for each ingredient, plus a readable over and under indicator. In a new plant it would seem wise to install a full springless dial that shows the weight at any stage of loading from zero to full capacity. The dial should be so hooked up that materials are back weighed. In this weighing procedure, the dial shows the load to which a particular poise has been set before a given material is weighed out and travels backward, reaching zero when the correct weight is

(Continued on page 182)



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Losorb is easy to use—simply add a small percentage (2% to 4%) to the mix. No other change in processing is necessary to give your blocks the decided advantage of *waterproof!*

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Ready-Mix Plant Maintenance

(Continued from page 180)

reached. It is good thinking to equip a dial scale with beams so that moisture compensations can most easily be handled.

The ready-mixed concrete industry has been generally quite lax on the problem of proper care for weighing scales and scale members. Many producers do nothing about their scales until a plant inspector (or testing engineer) lays down the ultimatum—"no more concrete until the scales are checked!" The importance of proper maintenance of this vital equipment may also be forcibly brought to a producer's attention when he attempts to qualify his plant for turnpike work or other important construction.

In our own experiences, we have found that vital parts were not being kept clean; check nuts were not securely tightened; binding of the scale had been permitted to go unchallenged; scales, because of plant settlement, were out of plumb; appurtenances such as cable or wiring were acting as drags on the scale mechanism; graduation marks on several beams were improperly spaced; and cement was "hanging up" in hopper.

How about your own plant scales? Does your weigh man check them daily? Does he practice daily maintenance routines? Are interiors of cement hoppers regularly inspected? Do you know what parts need greasing or oiling? What is the dashpot? What oil are you using in it? Are the scales in proper horizontal and plumb position? When were they last checked (with test weights) for accuracy? Are all knife edges and shackles in clean, efficient, operating condition? Is glass intact in all the dials? Are graduated beam faces being properly protected against rusting? Do you employ the services of a competent scale engineer to regularly check the accuracy of your scales and make necessary adjustments and repairs?

If a good scale man hasn't seen your weighing equipment in a long time, you should promptly arrange for a complete inspection and repair job. After he has concluded his work, get him to give you a full report on his findings. You may learn that your plant operators have been "getting by with murder." If you are a quality-minded producer, a careful study of the scale man's report will undoubtedly make you more scale maintenance conscious.

Any state highway department or testing laboratory will gladly give a producer a list of procedures for checking weigh hopper scales. These step by step checks are done with test weights, require several hours of plant time and the employment of two or more men to handle the iron. The testing goes on with each separate beam (others locked out of play) either until the full capacity of the scale is reached or until the inspector is satisfied by constantly obtaining uniform results that the scale hasn't changed since last checked.

Because different makes of hopper scales vary considerably in construction, any general suggestions for making adjustments or repairs would be useless. Maintenance men should either follow the instructions given in the scale manufacturer's manual or follow the advice of the scale engineer responsible for the proper functioning of the weighing equipment in the plant.

Your own weigh man should check his scales every morning and afternoon to see whether the indicator is on zero or whether the scales have any change in them. Once a week he should check all pivots and bearings. Any cement or stone that has become lodged should be removed. Because

(Continued on page 184)

Add a New Profit-Maker
increase your volume

PRODUCE CONCRETE JOISTS, LINTELS AND FENCE POSTS with the KIRK & BLUM HEAVY DUTY VIBRATING TABLE

Your experience in the building trade should make it easy to build up a profitable business in this new line. The products are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 3210 Forrer Street, Cincinnati 9, Ohio.

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The Kirk & Blum Vibrating Table requires a small initial cost, lets you make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.

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Manufacturers of steel forms of all types . . . Curb, Gutter, Sewer, Road

SAVINGS ON CRANE RENTAL PAY FOR GERLINGER *in less than One Year!*

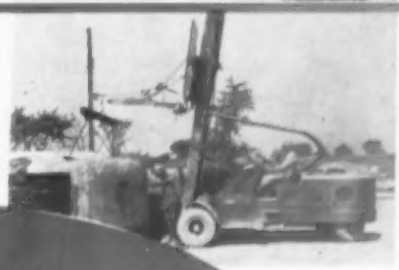
One-Man Operation of JOB-PROVED Fork Lift Truck Cuts Payroll by TWO for CONCRETE PIPE CO. OF OHIO, INC.

The Concrete Pipe Company of Ohio, Inc., for a number of years was forced to rent a portable crane to handle large, heavy, cumbersome pipe at its North Randall, Ohio, plant. Operating and servicing crane required three men full time.

When the versatility of a Gerlinger fork lift truck was demonstrated... when it was shown that it not only could do the work of the rented crane, but also could transport pipe in the yard *and* in the drying kilns, as well as load trucks... *all a ONE-man operation*... the economies of Gerlinger mechanical handling were soundly proved!

Since then, Concrete Pipe of Ohio has acquired a fleet of three Gerlinger fork lift trucks which are kept profitably busy at both the main plant and the Erie, Pennsylvania, plant.

Versatile Gerlinger proves invaluable to Concrete Pipe of Ohio for yard, kiln, transporting jobs.



Gerlinger Powerhouse makes light work of heavy, cumbersome pipe, replacing costly, limited-in-use crane in two plants.

"S" SERIES FORK LIFT TRUCKS
5 short wheelbase (106") models.
4 to 8-ton capacity.
Lifting heights from 10' up to 18'.

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6 long wheelbase (130") models.
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GERLINGER PRODUCTS

SEND TODAY FOR NEW GERLINGER FORK LIFT TRUCK CATALOG...

Gerlinger Fork Lift Trucks consistently outperform other material handlers in the concrete field. Gerlinger's exclusive counter-active weight distribution eliminates the common problem of varying load widths and weights of pipe, brick, tile and concrete block. Gerlinger equipment can save time, money and manhours for your firm, to No obligation.

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CONCRETE
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Illustrates our complete line of equipment. Contains pages of valuable tips for the concrete pipe manufacturer. Write today for your free copy and estimates.

Quinn WIRE & IRON WORKS
BOONE, IOWA

PLANT MAINTENANCE

(Continued from page 182)

of dusty conditions that generally prevail around ready-mixed concrete plants, it is not good practice to grease or oil pivots and bearings. The weekly check (or whenever possible errors come into the picture) is a good time to make sure there are no obstructions to the movement of the weigh hopper or levers.

On the relation of a plant operator to his batching scales, Russ Ochsenhirt, at the 1956 Ohio Short Course on Concrete, had this to say:—". . . His scales should have a periodic check by experienced scale men, but the operator should perform his own inspection for such items as dusty and dirty bearing points, obstructions retarding clearance of batch hopper, buildup of aggregates or cement in hopper, buildup of cement dust in vent tube causing drag on batcher hopper, and dribbling out of cement and aggregate bin gates."

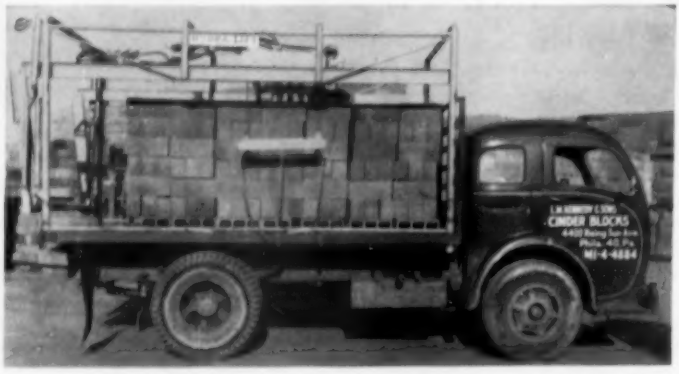
As your weigh man works with the scale engineer in checking accuracy of the equipment, he will pick up a few tricks on that particular make of scale that will later enable him to decide whether he has any trouble on his hands. Whenever a scale is being checked by outsiders, it is good practice to have the same maintenance man from your company work with the engineer. By continuing this practice, you will soon have an employe with considerable practical knowledge on care of that particular piece of equipment.

From his association with the scale engineer, he will learn that (1) before testing and adjusting, the scale must always be on zero; (2) errors on any dial scale are always computed in graduations, not weight increments; (3) he should always think, speak, and compute errors in graduation; (4) with the pendulum weights used to correct errors, the error of full capacity is twice as great and in the same direction as the error at half capacity, and that he is to raise the pendulum weights if the reading is slow; lower the pendulum weights if the reading is fast. If results obtained do not hold to the expected pattern, then other troubles exist and an engineer's services should be obtained to seal the scales.

A producer should give special consideration to the accuracy and condition of his cement scales. There is an almost certain accumulation of cement dust. Any buildup of hardened

(Continued on page 186)

HYDRA-LIFT UNLOADER



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WHY LET DELIVERY COSTS EAT UP YOUR PROFITS?

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A saving of more than $20.00 per working day showed that the Unloader would pay for itself well within the year. As a result, Kennedy's are now operating their second HYDRA-LIFT and with it are realizing similar savings.

Our HYDRA-LIFT customer list continues to grow. A number, like Kennedy's, now experience multiple savings through the use of several Unloading units. Two such are:

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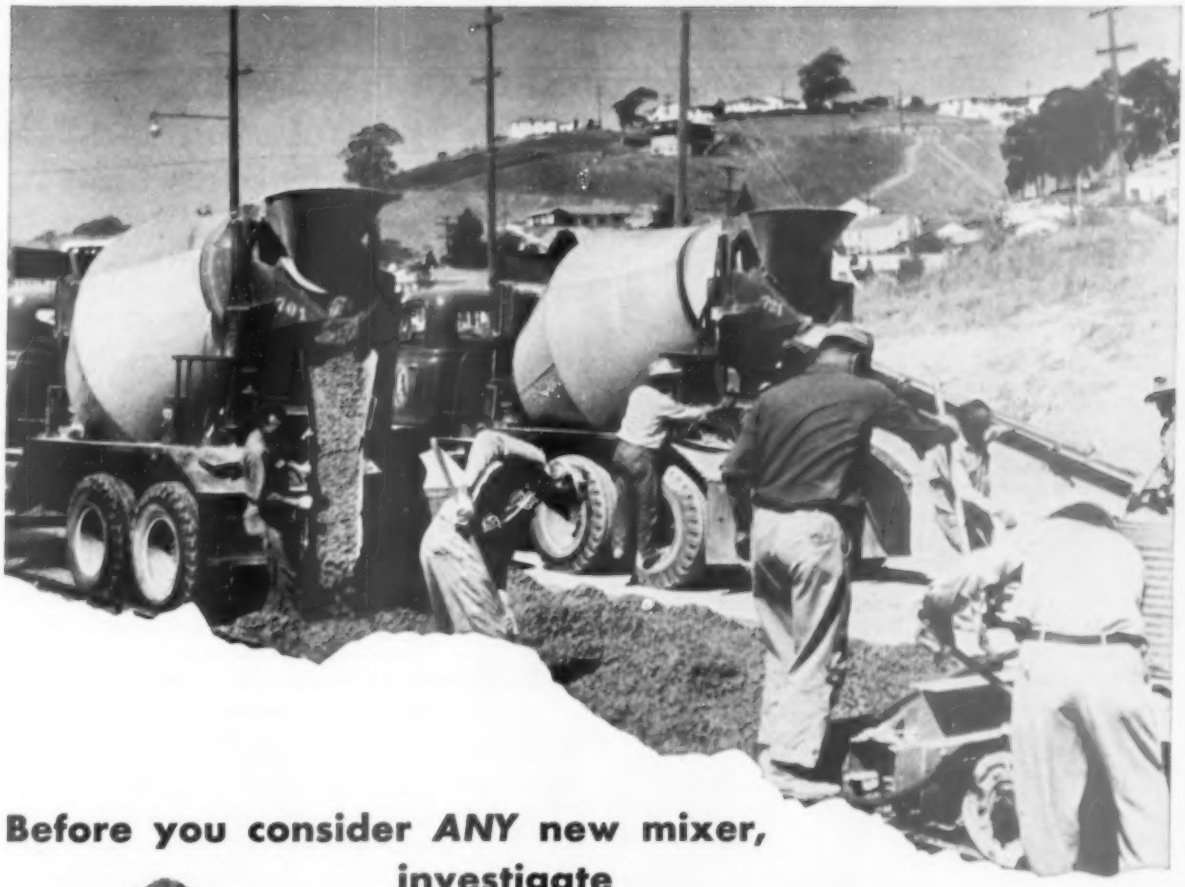

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ONE FRAME FOR BOTH TRUCK AND MIXER — ONE ENGINE FOR BOTH

Because of its proved, practical features, the new Smith INTEGRAL is providing the ready-mix industry with an entirely new set of standards and advantages.

You have ONE frame for both truck and mixer.

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Power is taken off the truck engine ahead of the clutch. The mixer continues to run regardless of clutching or gear shifting. You can select most standard trucks for the Smith INTEGRAL, and forget about the former costly "fight" between mixer frame and truck frame.

This composite of a mixer and a standard truck results in significant savings. Write for details.

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A 8660-1P

World's Largest Block Plant..

Strangely, Colossus of Industry is Located in Sparsely Settled West Instead of Metropolitan East . . .

"Mighty oaks from little acorns grow". This familiar adage can certainly be applied when relating the story of the Superlite Builder's Supply Company, Phoenix, Arizona. This progressive block plant was founded about 11 years ago, on the proverbial "shoestring" (cash assets of about $3500.) Today, this company operates, under one roof, the largest block plant in the world. And the fact that the plant is located in "The Valley of the Sun" (Phoenix, Arizona) instead of in a more thickly populated area, makes the success of the company all the more remarkable.

• • •

The seven Besser Vibrapacs, shown in the picture at left, are playing an important role in this extraordinary success story. All seven machines operate continuously, 24 hours of the day, with practically no downtime. Each machine receives the mixed concrete from a Besser 50 cu. ft. Mixer, and a travelling weigh batcher delivers aggregate and cement to each Besser Mixer. For aggregate, a blend of volcanic scoria is used. Materials come from company-owned and operated deposits. Eleven carloads are unloaded and processed each day.

P. M. "Coach" Thomas, General Manager of Superlite and one of the founders of the Company.

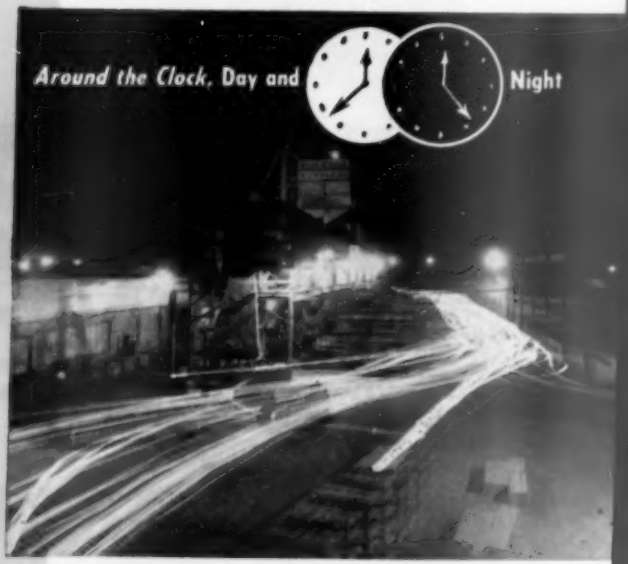
MRS. FRAN SMITH, *Advertising Director*

M. E. WAGONER, *Sales Manager*

ROBERT MIZER, *General Plant Superintendent*

P. M. "Coach" Thomas says:

"After the first month's operation with a Besser Vibrapac, we have never showed a loss. This is something we couldn't say when we operated other machinery, as month after month we showed so much downtime that we were always operating in the red. By having the entire cooperation and teamwork offered by the Besser Company, we have been able to prosper and progress in a fashion that we do not think possible with any other equipment or company."



The Superlite plant operates 24 hours a day, with a daily production of 140,000 units. The interesting picture, above, is the result of a time exposure, taken at night. It shows the path of the lift trucks moving green block to the twenty two high temperature steam curing kilns. A 12 hour steam curing cycle is used.

BESSER COMPANY

is Another BESSER Booster*

* This is the 127th of a series of ads featuring leaders of the Concrete Products industry who are stepping up block production with Besser Vibrapac machines.

75% of ALL Phoenix Construction is Built with Superlite Block!

Phoenix, Arizona is one of the fastest growing cities in the United States, and the Superlite Builder's Supply Company certainly has reason to be proud of the part its product SUPERLITE Block has played in the city's progress. About 75% of all construction is of Superlite masonry units. Wherever you look, you find new homes, commercial structures, schools and churches built with concrete masonry units produced on Superlite's Vibrapac machines. Most of these buildings are designed by architects. All combine beauty with permanence, plus architectural flexibility.

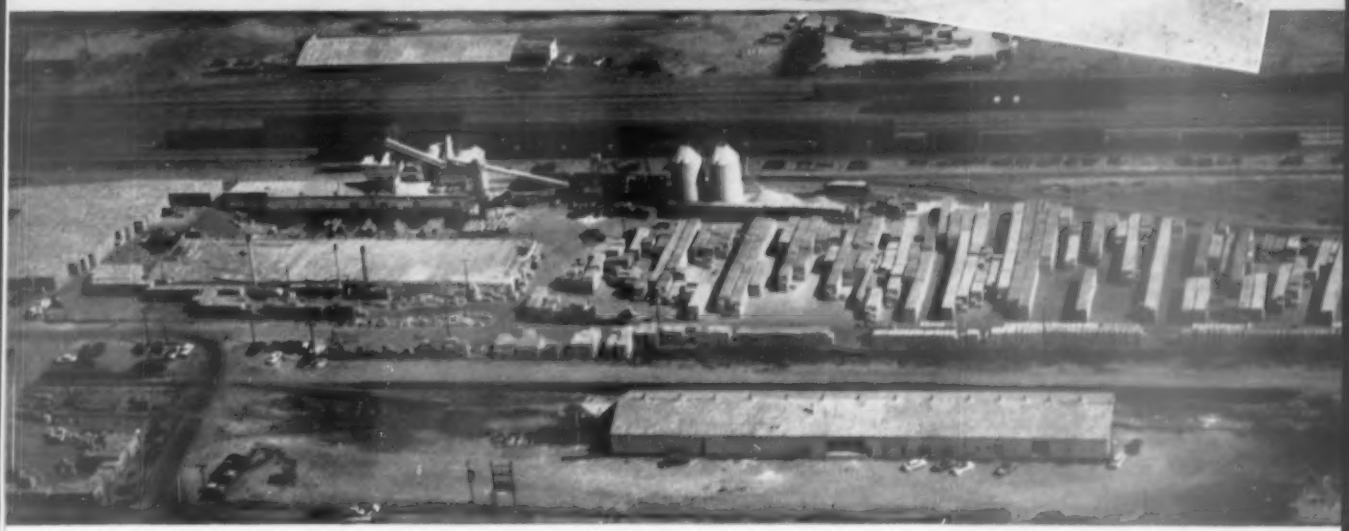
Meet "SUPERLITE SAM", the company's clever trade character. He says: "I am the most economical building material you can buy, and I just refuse to wear out. Termites cannot ruin me. I defy the sun or the cold to penetrate me. And, with all modesty, I must tell you, everyone says I have great beauty."

A typical Phoenix home built with 8" x 4" x 16" Superlite Block produced on Vibrapac machines. Note the charm and beauty of this all-masonry home, built for permanence.

Steel hopper bottom cars at R. R. siding. Materials are conveyed from pit to crushing and screening plant, then to storage bins.

High Quality Block, *plus Progressive Sales Policies,* Assure Success!

The Superlite Company is not only interested in attaining mass production records; the firm insists that each manufactured unit be of a high quality block, capable of meeting the highest standards of the industry. Good salesmanship, production planning and plant economies have also helped the company to achieve success. Of course, the little trade figure, shown above, plays an important role in selling more than 45,000,000 units annually (8" or equivalent) to people in the Phoenix area.



Aerial view of the 7 Vibrapac machine plant of the Superlite Builder's Supply Company at Phoenix, Arizona. Note extensive yard storage facilities. Block are stored for a minimum of thirty days. Superlite also operates a Vibrapac block plant in Calipatria, California

BESSER COMPANY, Box 135, Alpena, Mich., U.S.A.

1ST in Concrete Block Machines

BESSER VIBRAPAC

A 8551-2PBC

COMMENT
from the
BUTLER ENGINEER
. . . Of a Giant, Whiskers and Successful Bids

Your Butler engineer has now dealt with the ultimate — the pinnacle — the Mt. Everest of complexity in materials handling and plant design. Did I say "plant"? I meant multiple plants. It's a gigantic layout. On my preliminary scale drawings a line of 10 freight cars looked small as 10 whisker bristles from a morning shave. It's a huge ready mixed concrete deal; they sell sand, gravel and other aggregates, and they also have a large asphalt operation. Materials come in and ship out by train, by barge and by truck. And conveyors had to be designed to switch from barge to truck and again to train from the enormous stock piles. In several instances conveyors had to be reversible on exactly the same plane.

The entire yard is a network of rail lines and sidings, yet we were able to plan all truck routes without crossing any tracks . . . Have you ever seen a complicated wiring diagram? That's about what our drawings resembled.

But we're all proud to have been consulted and we're doubly proud our plans and recommendations are accepted. We feel that it is not only a feather in our cap; we think it represents more feathers than are in an Indian war bonnet.

•

Roadbuilders have a cheerful fact to deal with since the development of the Butler *Automatic* Roadbuilders Plant. As you may know, it batches sand, cement and two sizes of stone *with only one operator.* (Suggest you write for Bulletin describing it) . . . The cheerful fact? A contractor with this plant can successfully bid any paving job he wants, and make a bigger profit.

That's a *concrete* fact.

Yours faithfully,

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

PLANT MAINTENANCE

(Continued from page 184)

cement must be prevented. Hanging up in the weigh hopper may be the cause of weighing errors. The weigh man must be made to understand that over-weighing of cement leads to sharply increased material costs and that short weighing on cement jeopardizes the quality of the concrete and points the finger of suspicion at the ready-mixed concrete company.

No producer can afford either a careless weigh man or improperly functioning cement scales. Make sure that you have good accurate scales, that they are being regularly checked, and that the responsibility for their operation and care is in good hands.

N.C.M.A. CONVENTION

(Continued from page 171)

Mr. Reiner described a forced hot-air dryer installed in 1953 by Cleveland Builders Supply Co. after the covered storage area became inadequate to supply the large market for low moisture content block. The installation includes a 9- x 15- x 72-ft. dryer (capacity of 5760 8-in. units), with eight sliding doors on each side; a 6- x 6- x 8-ft. oil-fired booster with four burner openings; a 5-hp. suction fan supplying the heated air to the duct beneath the dryer; a 5-hp. exhaust fan expelling the moisture-laden air to the return flue above the dryer; and an exhaust stack. The dryer has a grid floor with openings varying from ½-in. in the first bay to 2-in. in the last bay; this permits equal heating throughout the kiln. The end and side walls are built of 8-in. block, the ducts of transite.

The speaker reported that the drying cycle is 12 hr., including 2 hr. for loading and unloading and 10 hr. for actual drying. The block are taken from yard storage after 18 days by lift truck, and loaded into the dryer, two (loose) cubes high. The booster is fired to reach 350 deg. F. during the first 4 hr., then steadied for the remaining 6 hr., with a dryer temperature of about 230 degree F. The exhaust fan isn't turned on until the fifth hour, with the damper opened one-quarter; in the last hour, the damper is fully open. This system results in a block moisture content of 20 to 28 percent, he said.

Safety Awards

Winners in the second annual N.C.M.A. safety contest were presented special awards by the association. The presentations were made by Henry Quaritius, Nailable Cinder Block Corp., New York, N. Y.

(Continued on page 198)

Your Customers will say . . .

when you offer them a choice of

23

DIFFERENT CEMENT & MORTAR COLORS

Made by Williams, this is the broadest selection of fine Cement and Mortar colors on the market. By offering your customers a choice of 23 shades, you can quickly and easily settle upon one having the exact chemical and physical properties your color specification requires.

CEMENT COLORS BY WILLIAMS

Here you have a choice of 18 shades —6 Reds, 3 Greens, 3 Browns, 3 Yellows, 1 Black, 1 Blue, and 1 Orange. Each shade is manufactured to meet the most exacting specifications for cement work—as recommended by the American Concrete Institute and the Portland Cement Association.

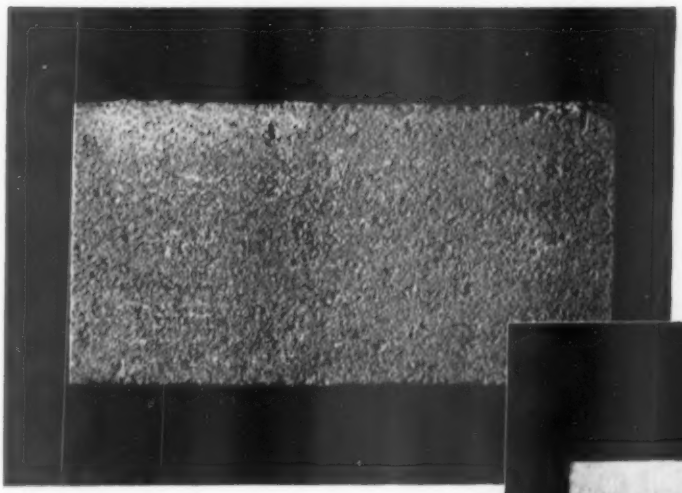
MORTAR COLORS BY WILLIAMS

Here you have a choice of 5 different shades — one shade in double strength red, light buff, dark buff, chocolate and black. Each of these colors may be used with excellent results with any standard mortar mix or with a ready-made Bricklayer's Cement.

Write today for color samples and complete technical information on how Williams Cement and Mortar Colors give you superior results. Address Dept. 10, C. K. Williams & Co., Easton, Pennsylvania.

WILLIAMS
COLORS & PIGMENTS

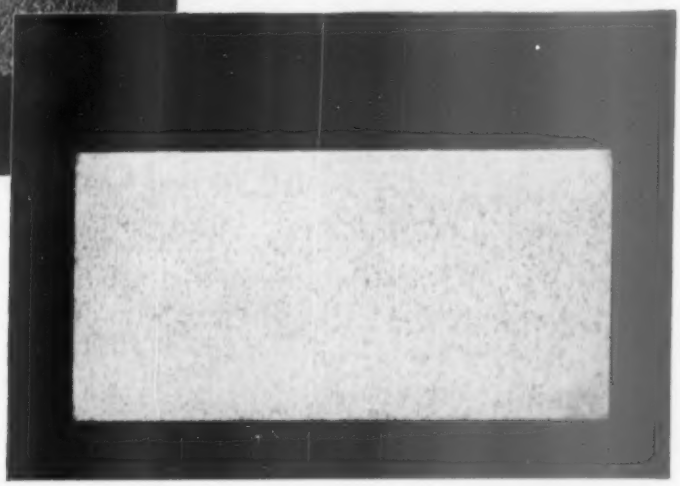
C. K. WILLIAMS & CO.
East St. Louis, Ill. Easton, Pa. Emeryville, Cal.



ORDINARY BLOCK Without NR PLASTIC—
ROUGH FINISH, DARK COLOR

IMPROVED BLOCK* With NR PLASTIC—
SMOOTH FINISH, LIGHTER COLOR

* Manufactured at HOERNING'S CONCRETE PROD CO., Menasha, Wisconsin.



With
JUST *ONE* TABLESPOON OF
DRY, POWDERED
NR PLASTIC
PER BAG OF CEMENT!

GREATER PLASTICITY IN THE GREEN UNIT — PLUS 20% LIGHTER COLOR . . .

Cost. . . ½c per Bag of Cement!

Hydrate ALL the cement in your dry block and pipe mix . . . with just *one* tablespoonful of dry, powdered NR PLASTIC per bag of cement. Cost.....½c per bag!

YOU'LL GET . . . . . .

A 20% lighter colored unit with a more thoroughly wetted cement paste! Complete hydration through complete saturation without adding more water! Sharper corners . . . better texture . . . smoother, denser surfaces through greater compaction! Faster, cleaner feeding into . . . and stripping from . . . the mold box! 50% reduction in wear on mold box liners! Greater plasticity in the green unit through absolute dispersion of water and cement . . . and . . . complete coating of all the aggregate particles! Simple and economical to use . . . add dry as it comes from the container! Cost ½c per bag of cement!

MAIL COUPON TODAY

Write for literature and free 8 lb. sample of NR PLASTIC.

Edick Laboratories
427 W. National Ave., Milwaukee 4, Wis.

Gentlemen, Please RUSH Sample of NR PLASTIC

NAME ..... **TITLE** .....

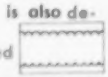
FIRM .....

ADDRESS .....

CITY ..... **ZONE** ..... **STATE** .....

Edick LABORATORIES

427 W. National Ave. Milwaukee 4, Wis.

When a mason uses reinforcing in a masonry wall, he lays the reinforcing on the last course like this With ordinary reinforcing, all the wires are butt-welded in one plane. This allows the side bars to rest right on the blocks. Then the mason puts on his mortar. Steel doesn't float so, obviously, the mortar can't get under the side bars. So the mortar is only bonded to the top and sides. With Wal-Lok, the Tie Rods are welded across the Side Bars. The mason puts Wal-Lok in the wall *with the Tie Rods DOWN* This holds the Side bars up away from the blocks, and the mortar completely surrounds each Side Bar With Wal-Lok, the mortar grips all the way around! When you try to hang onto a rod, you don't hold it with your finger tips You hold it in your fist with your fingers wrapped all the way around. Why expect mortar to do something you can't do? All Wal-Lok is also deformed and knurled  for a positive bond the full length. The value of any reinforcing depends *entirely* on its bond to the mortar.

All this while holding an overall thickness of 7/32".

WAL-LOK

ADRIAN PEERLESS INC.

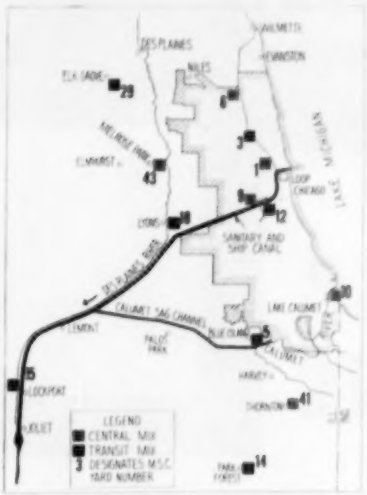
1481 E. Mich. St., Adrian, Mich.

Efficient Dispatching System

(Continued from page 155)

spaces which were blocked out by the spot carbon paper in the first typing (Fig. 6).

Copies 1 and 8 are order copies, No. 1 going to the sales department and No. 8 to the order board. Copies 2 to 7 represent the customer invoice set. Copy 2 is made of translucent paper, permitting the reproduction of additional invoice copies on a Bruning white print machine for customers who request extra copies. Copies 3 and 4 are for the customer, No. 5 is sent to the customer to be returned with the remittance, No. 6 is a sales analysis copy, and No. 7 is a posting copy, which is posted to the accounts receivable ledger.



Map showing location of yards having ready-mixed concrete batching plants. The company also maintains other yards where aggregates and building materials may be obtained

Yard Dispatching

Fig. 4 shows the teletype order as received at the yard office. This form, referred to as the "order shipper," has a special foldover portion which is conveniently used as a dispatch schedule. This combination form replaces an earlier separate dispatch schedule form, which was more bulky and harder to handle.

By recording each delivery and the cumulative number of cu. yd. shipped on the order shipper, the dispatcher can keep a running account of the job progress. Truck times, including "arrived yard," "left yard," "arrived job," and "left job" are also entered. This is especially important in determining excessive holding time.* The form also has data on the bag mix, in terms of weight of each material per cu. yd. of concrete; these data are used to determine daily inventory withdrawal of each material.

When the job is completed, the dispatcher enters the quantity shipped on the form, as well as any special charges (i.e., waiting time, etc.). The order shipper is two-part, one copy remaining in the yard office file, and the second being routed to the main office, where it is used for billing purposes.

Fig. 5 shows the delivery ticket with data corresponding closely to that shown on the order shipper. Note that entrees include truck times, number of load, cumulative amount of concrete delivered, customer order number, and M.S.C. order number. This form is five-part, with the copies being routed as follows: No. 1, signed by the customer and returned by the driver to the yard (note that signature certifies truck times); No. 2 and 3, customer copies; No. 4 (green), billing department copy; and No. 5 (yellow), yard copy. Copies 1 to 3 contain sale and delivery condition clauses on the reverse side, which pertain to the roadway, delays, and responsibility.

To facilitate the yard dispatcher's job, the company uses a visible margin dispatch rack for holding the order shippers. The unit is compact and accommodates about 30 shippers. Because only the bottom portion of each order is exposed on the rack, the customer name is repeated along the bot-

(Continued on page 193)

Closeup of visible margin dispatch rack for order shippers. Magnetic buttons on right bear numbers of trucks assigned to various jobs

*The company policy is to allow 5 min. per cu. yd. holding time. The overtime charge is then based on a rate of 15¢ per overtime minute.

The new STANDARD OF PERFORMANCE

The new SYMBOL OF BUILT-IN QUALITY

NOW AVAILABLE—the 1956 line of precision-built Westinghouse Transit Mixers, with these *outstanding* features:

- *Exclusive,* patented, fully-enclosed gear drive for the drum—no chains, no exposed gears—less trouble—less maintenance.
- Self-aligning, ball-and-socket front end mounting *at the drum*—an exclusive feature that prevents misalignment of driving parts.
- Double-action mixing drum with deeper mixing blades, plus 6 auxiliary blades that produce a faster, more uniform mix.
- 2-speed transmission that permits perfect control over wide range of drum rotating speeds.
- New, handy swing-away chute for direct discharge into high forms, hoppers and buckets.
- Single drum reversing levers and throttle controls—at each end of the mixer.
- Plenty of power—properly placed, completely controlled, efficiently applied; Power-Take-Off, optional, available on all models.

Compare WESTINGHOUSE TRANSIT MIXERS—feature for feature—and you'll buy the new STANDARD OF MIXER PERFORMANCE!

* * *

WESTINGHOUSE TRANSIT MIXER DIVISION
LeTourneau-Westinghouse Co.
INDIANAPOLIS • INDIANA

Get the complete story on the 1956 line of Westinghouse Transit Mixers, available in five sizes from 4½ to 6½ cubic yards. Write for Bulletin 256.

CLIP AND MAIL COUPON TODAY . . .

Westinghouse Transit Mixer Division,
LeTourneau-Westinghouse Co., Indianapolis, Indiana
Please send free illustrated booklet on the new Westinghouse Transit Mixer.

Name .....
(PLEASE PRINT)
Company .....
Address .....
City ..... Zone ..... State .....

CP-563

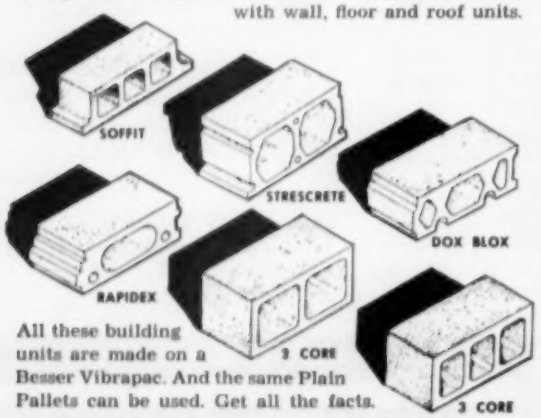
Go After the Entire Market!

Block for WALLS

Block for FLOORS

Block for ROOFS

Fire-safe walls? Of course! But floors and roofs should be fire-safe, too. Walls are full of openings (windows, doors, etc.), while floors and roofs are relatively solid. Actually, TWICE the volume of block is required for floors and roofs than is required for walls. So why not go after this profitable market? Supply customers with wall, floor and roof units.



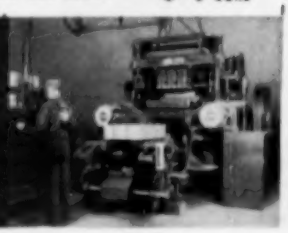
All these building units are made on a Besser Vibrapac. And the same Plain Pallets can be used. Get all the facts.

Write for Bulletin

BESSER COMPANY

ALPENA, MICHIGAN, U. S. A.

Complete Equipment for Concrete Block Plants



Watch for the NEW

MIX-MIZER

THE RIGHT METER FOR AUTOMATIC BLOCK MIXER CONTROL

- FULLY GUARANTEED
- QUICKLY INSTALLED... WITHOUT MECHANIC

See our announcement for complete details in the April issue of Concrete Products or write, wire or phone address below

ONLY $395.00 . . . . fully guaranteed

W. H. LACKEY, Inc.

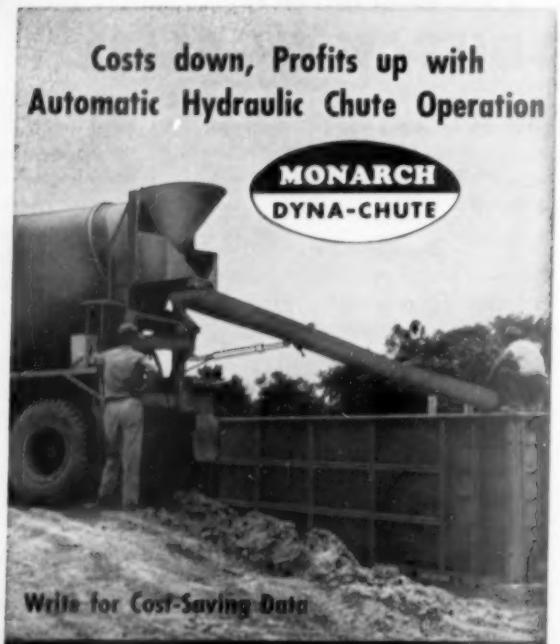
Block Plant and Industrial Equipment

"WE ARE SPECIALISTS IN YOUR BUSINESS"

Phone Circle 6-8926

P.O. Box 25 — Kingsport, Tennessee

Costs down, Profits up with Automatic Hydraulic Chute Operation



Manufacturers of Hydraulic Controls

MONARCH ROAD MACHINERY COMPANY

1331 Michigan St., N.E. — Grand Rapids 3, Mich.

tom margin, thus enabling the dispatcher to readily spot the order.

Another interesting feature is the metal board used for truck scheduling which is inserted under the rack and extends along the right margin. There is space on the board adjacent to each order shipper for placing a small magnetic button bearing the number of each truck assigned to this particular job. When a truck returns from the job, the dispatcher can use the truck number as an indicator for quickly finding the corresponding order shipper and then proceed to order the next load. This device was found to be especially useful for new dispatchers.

For efficient transmitting of orders and loading instructions from the dispatcher to the batching plant operator, Material Service uses a Telautograph system at each ready-mix plant. This electrical device permits the dispatcher's written message to appear simultaneously on the batching operator's Telautograph unit. After the order is filled, it is crossed off by the batching operator, thus completing the cycle, and avoiding errors.

Plant intercommunication systems also play an important role at Material Service plants. For example at Yard 1, location of one of the larger ready-mix plants, five intercom (Executone) sets are used; these are located in the dispatcher's office, on the batching floors of the central mix and transit mixing plants, on top of the central mix plant, and at the truck loading point. Similar communication set-ups are found at the other plants.

Two-Way Radio

About 2½ years ago Material Service, on an experimental basis, installed

At Yard 43 in Melrose Park, a central-mix plant, a 150-ft. high-gain antenna has been placed next to office building

25th Anniversary

Combination WORKhorse and RACEhorse! that's

The new ROCKET "65"

Seldom do you find a piece of machinery that combines the strength, durability and dependability of a WORKhorse with the speed and mobility of a RACEhorse. But that's what ready-mix operators are saying about the new Rocket "65"—a versatile 6½ to 7 yard mixer. The Rocket is designed and engineered to operate for years at maximum efficiency, with surprisingly little maintenance. Every conceivable ease-of-operation feature, *plus* tremendous strength, has been *built in.*

After you've bought a Rocket, you'll agree that it is both the workhorse *and* racehorse of your fleet!

Also available in 3, 3½, 4½, 5½ yd. models.

ALL THESE FEATURES *at* NO EXTRA COST!

HYDRAULIC CHUTE CONTROL is fully automatic. Controls grouped for easy access.

ALUMINUM EXTENSION CHUTE attaches to 36" fold-over addition to main chute. Total discharge chute: 12' 6".

ELECTRIC REVOLUTION COUNTER kit included; you can handle most specifications with the Rocket!

SPECIAL ALLOY, abrasion resisting steel used at all wear points.

UNOBSTRUCTED HOPPER, for rapid charging, no spilling or waste.

POSITIVE CHAIN DRIVE, flexible power, not affected by truck twist, road shock.

STANDARD INDUSTRIAL ENGINE, truck-type transmission. Repair parts readily available.

THREE-POINT SUSPENSION, one-piece cast steel precision machined ring.

DEMAND THE BADGE OF DEPENDABILITY

CONCRETE TRANSPORT MIXER CO.

MAIL THIS COUPON TODAY!

Gentlemen: Please rush full information, prices and terms on the following:

☐ New Rocket Revolving Drum Truck Mixer
☐ Hi-Lo Stationary Drum Mixer
☐ Batching Equipment ☐ Water Meters
☐ Material Handling Equipment

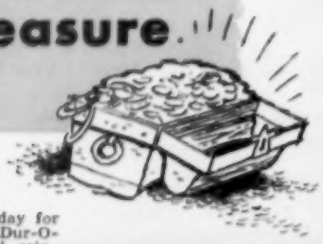
Name_____
Firm_____
Address_____
City_____ State_____

4987 FYLER AVE., ST. LOUIS 9, MO. FLanders 2-7800

DUR-O-WAL

Is Your

BURIED Treasure.



Phone, wire or write today for complete information on Dur-O-waL . . . the original steel reinforcing member designed to combat cracking of masonry walls. This sales-builder is a tie-in item, which steps-up volume and customer satisfaction. Get the facts now from Dept. 3T, Dur-O-waL plant nearest you.

Dur-O-waL lies flat in the mortar bed . . . . handles fast . . . . saves time . . . . and stores easily; compactly.

Butt-Weld • Trussed Design

DUR-O-WAL

the Backbone of Steel for EVERY masonry wall

Dur-O-waL Div., Cedar Rapids Block Co., CEDAR RAPIDS, IA. Dur-O-waL Prod., Inc., Box 628, SYRACUSE, N.Y. Dur-O-waL of Ill., 119 N. River St., AURORA, ILL. Dur-O-waL Prod. of Ala., Inc., Box 5446, BIRMINGHAM, ALA. Dur-O-waL Prod., Inc., 4500 E. Lombard St., BALTIMORE, MD. Dur-O-waL Div., Frontier Mfg. Co., Box 49, PHOENIX, ARIZ. Dur-O-waL, Inc., 165 Utah St., TOLEDO, OHIO

Soon to serve Ontario

To answer to the demand for Portland Cement in the Toronto area, the St. Lawrence Cement Company is presently building a modern cement plant in Clarkson, near Toronto.

Starting production on January first, 1957, the new plant will produce a staggering 12,000,000 bags of cement yearly. A total of 18,000,000 bags a year with the Quebec plant's production.

ST. LAWRENCE CEMENT CO.

18,000,000 bags of PORTLAND CEMENT ANNUALLY

QUEBEC

TORONTO

STAR BUILDING, 80 KING ST. WEST, TORONTO, TEL: EMpire 2-2541
HEAD OFFICE: VILLENEUVE, QUEBEC, TEL: MOntcalm 3-7831

two-way radio in a fleet of 20 transit mixers operating out on one of its suburban yards. The experiment was so successful that early in 1955 the company converted its *entire* truck fleet to two-way radio. Each yard supervisor also has a radio set in his company car.

The radio system is operated under the Citizens Radio Station License, which is used by private-citizens, taxi companies, etc.; transmission is on a frequency of 460.05 mc. and receiving on 468.05 mc. The Citizens license was obtained rather than the Special Industrial Radio Service license (which is used by the majority of ready-mix producers in the country) because the latter license is not available for producers operating in a metropolitan area in which the population exceeds 500,000. Disadvantages of the Citizens band include somewhat higher costs of radio equipment and lower broadcast range (10 miles compared to 15-20 miles for special industrial band). Advantages include better reception because of shorter waves and higher frequency, simpler operation (no operator's license or written log of transmission required), and rapid processing of the license application.

All of the plants except four have their own base station, consisting of a Model CSU-15A CR-418 Duplex 117-volt 50-60 cycle a.c. unit and a high-gain antenna. The sets installed in the trucks and cars are Models CMU-15A1 6-volt 12-watt units. Radio Corporation of America supplied all of the radio equipment.

In planning the radio installation, Material Service decided against the use of a centralized base station located in the downtown office because the

E. R. Fish, manager of ready mix delivery equipment, has headquarters in Yard 1

Why not look the

LINTEL MARKET

squarely in the face . . . ?

If you do you'll find a sizable, profitable market with the customer you are now selling.

Your next step will be to ask for a thorough description of the KENT Lintelator. This simple, relatively inexpensive machine has been in successful use for several years producing lintels that are popular with builders.

Lintelators are available for making lintels up to 8″x12″x10′8″. With this ingenious machine up to 1000 feet of lintels has been produced by one man in a day.

Texture just like that of the blocks appeals to builders and they are especially pleased to be able to dispense with steel lintels which involve another building craft with frequent delays.

Write for the LINTELATOR Bulletin now while you're thinking about it.

See KENT MACHINERY IN OPERATION RIGHT IN YOUR OWN OFFICE

Just ask to have our Representative bring the Movie Projector.

The KENT MACHINE CO. CUYAHOGA FALLS OHIO

DIVISION OF THE LAMSON & SESSIONS CO.

CONCRETE PRODUCTS MACHINERY SINCE 1925

Canadian Distributor: Wattlaufer Equipment, Ltd., 49 Morton St., Toronto 12, Ontario

KEEP ABREAST WITH INDUSTRY TRENDS THROUGH ROCK PRODUCTS

CONCRETE BURIAL VAULTS

AMERICA'S FINEST MOLDS AND LOWERING DEVICES

TERRITORY FRANCHISES

BERG VAULT SYSTEM

BERG VAULT CO.

EQUIPMENT DIVISION

1020 LUCAS HUNT RD. ST. LOUIS 32, MO.

SIDE-O-MATIC

UNLOADS ON BOTH SIDES AND REAR

UNLOADS INTO BASEMENTS

PARTIAL LIST OF SATISFIED USERS:

Raymond W. Bartlett
West Creek, New Jersey

Allco Concrete Products Company Inc.,
Patchogue, Long Island, New York

City Cement Block Company
Bridgeport, Connecticut (3 units)

Marquart Concrete Block Company,
Waterloo, Iowa

The Plasticrete Corporation
New Haven, Connecticut (2 units)

Daggett's Concrete Products
South Haven, Michigan

South Hammond Concrete Products Co.,
Hammond, Indiana

Maule Industries, Inc.,
Miami, Florida

Tait Block and Supply Co.,
Port Huron, Michigan

Putnam Mason Supplies, Inc.
Carmel, New York

Concrete Masonry Corporation,
Elyria, Ohio (2 units)

Binkley and Ober, Inc.,
East Petersburg, Pennsylvania

Apex Coal and Supply Company,
Cleveland, Ohio

The Michigan Silo Company,
Peoria, Illinois (2 units)

The Ideal Builders Supply & Fuel Co.
Cleveland, Ohio (2 units)

SIDE-O-MATIC UNLOADER CORP.

P. O. Box 1561, York, Pa. • Phone York 7357

K-3

ONLY KORPAK HAS 3-WAY PACKING

Density determines quality . . . and packing determines density. No block machine has such packing thoroughness as the Korpak. Why?

Because the cores, instead of serving only to form the voids, are put to work as active densifying agents. Under direct-connected motor power, they move back and forth 3600 times a minute, with each stroke serving to pack incoming material *laterally* against the mold box sides.

Lateral packing from around 300 square inches of packing area is augmented by the upward pressure, with the amount of squeeze adjusted to fit the kind of aggregate being used.

1-man operation . . . hydraulic movements . . . electrical controls. 2¼ tons of machine self-contained to occupy only 33 square feet of floor space.

Korpak machines are available on sale or lease-purchase. Write for descriptive catalog.

Core-Packing Assembly

W. E. DUNN MFG. CO.
544 W. 24th St.,
Holland, Mich.
996 Dundas Highway,
Cooksville, Ont.

---

this new Erickson is

AR-TIC-U-LATED

MODEL P-7A 7,000 lbs.
MODEL P-10A 10,000 lbs.

United by a joint

IT TURNS IN THE MIDDLE—
TAKES THE CORNERS LIKE A BREEZE

Write for literature

Erickson has created a revolutionary new idea in platform trucks—it's ARTICULATED—with a joint or pivot between platform and drive wheels. Models P-7A and P-10A are the units for the new and unusual operations,—autoclaves, for instance—where you need utmost maneuverability with heavy duty capacity. With the ARTICULATED design, platform bed can be made up to 10 or 12 feet and still handle heavy, bulky loads with ease. These articulated models are in addition to the veteran Erickson P-5 and P-7 standard models, and built with the same rugged durability.

the WORKHORSE of LIFT TRUCKS

Erickson
POWER LIFT TRUCKS, Inc.
223 St. Anthony Blvd. N. E., Minneapolis 18, Minn.

radio traffic would have been too heavy. Further, with individual base stations, interplant communications are possible, and drivers can communicate with any plant, provided the radio range is not exceeded. The latter is

Mixer truck driver radioing back to yard office for instructions

especially important when it may become necessary to divert a truck from one yard to another during the daily operation.

The Material Service ready-mix truck fleet consists of White, Sterling and Autocar chassis on which are mounted Smith and Jaeger mixers. All mixers are driven by power take-offs to cut down on the truck weight and to avoid extra engine maintenance. About 85 percent of the White units are built with aluminum wheels, housings, hubs, cross members, to reduce the ready-mix truck weight. Generally the smaller, lighter units are used in suburban service. Smith tilting-type mixers are used in the central mixing plants; they range in size from 4- to 7½-cu. yd.

E. R. Fish is manager of ready-mixed concrete delivery equipment; Sherwin Lasky, chief of supervisors; Tom Hayden, truck maintenance manager; J. A. McGraw, general yard superintendent; and Herb Morgan, general manager of yards.

Concrete Pipe Outlook

THE AMERICAN CONCRETE PIPE ASSOCIATION'S managing director, Howard F. Peckworth, has reported that 1955 was "the best year the industry ever had, either tonnagewise or dollarwise." The rate of profit was off in many instances, but volume or tonnage was on the increase. Mr. Peckworth expects the 1956 volume to equal that of 1955, and possibly be higher. Competition, nevertheless, may be greater in 1956, he said, especially from corrugated metal and transite pipe. New construction expenditures may reach a record breaking total of $44 billion in 1956, 5 percent above the $42 billion record of 1955, according to estimates of both the Commerce and Labor Departments.

"I knew this would happen if you guys kept horsin' around with bagged cement!"

℞ (PREVENTATIVE PRESCRIPTION)
"Tailor made" bag to bulk conversion at Very Low Cost!
I. M. READY-MIX, M. D.

Ready-mixed operators everywhere are reducing overhead, increasing **profits,** by converting from bagged to **bulk** cement. Material Handling, Inc., specializes in developing bag-to-bulk conversion . . . tailor made to **your** specific requirements . . . at the **lowest possible cost.** Get the facts today!

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FLanders 2-7800
Affiliate Companies
Concrete Transport Mixer Co.
St. Louis
Fleming Manufacturing Co.
Cuba, Mo.

MATERIAL HANDLING, INC. CP
4987 Fyler Avenue, St. Louis 9, Missouri
Yes, we're interested. Send us more information on your material handling bag-to-bulk plan.

NAME_____
FIRM_____
ADDRESS_____
CITY_____ STATE_____

N.C.M.A. SAFETY AWARDS

(Continued from page 188)

Bronze safety trophies were awarded the following companies, each having an accident free record during the contest year:

CLASS A (plants having annual production in excess of 5,000,000 8- x 8- x 16-in. equivalents) — The Geist Builders Supply Co., Cleveland, Ohio.

CLASS B (plants with an annual production between 1,500,000 and 5,000,000 8-in. equivalents) — Palmetto Quarries Co., Columbia, S. C.

CLASS C (plants having an annual production less than 1,500,000 8-in. equivalents) — Fischer Lime & Cement Co., Concrete Products Division, Memphis, Tenn. This is the second consecutive Class C award for the Memphis firm.

In addition, a Certificate of Achievement was presented to each of the following companies for having operated during the contest year without any lost time accidents (an asterisk indicates the company had two consecutive accident-free years):

Aberdeen Block Co., Aberdeen, S. D.
*Adams Concrete Products Co., Ypsilanti, Mich.
Alaska Concrete Products Co., Fairbanks, Alaska
*Alwine Brick Co., New Oxford, Penn.
Auburn Cement Products Co., Inc., Auburn, N. Y.
Capital Concrete Products Co., Topeka, Kan.
Christensen Concrete Products, Grand Island, Nebr.
Concrete Products Co., Sioux City, Iowa
Concrete Supply Co., Inc., Evansville, Ind.
*Felicetti Concrete Products, Niagara Falls, N. Y.
Fergus Concrete Products Co., Fergus Falls, Minn.
Franklin Concrete Products Corp., Franklin, Va.
Fred Johnson Cement Block Co., Duluth, Minn.
*Hay-Con Tile Co., Detroit, Mich.
Illinois Brick Co., Franklin Park, Ill.
*Jackson Ready-Mix Concrete, Jackson, Miss.
*John Haeusser Concrete Products, Inc., Buffalo, N. Y.
Katterjohn Concrete Products, Paducah, Ky.
Kentucky Concrete Products, Inc., Newport, Ky.
*Maples Concrete Block Co., Cohutta, Ga.
Maramonte & Sons, Milwaukee, Wis.
*Mitchell Concrete Products, Inc., Mahomet, Ill.
*M. J. Grove Lime Co., Frederick, Md.
N. C. Products Corp., Raleigh, N. C.
*Northwest Concrete Products Co., St. Cloud, Minn.
*O. G. Hanson & Son, Princeton, Minn.
Patterson Supply Co., Monongahela, Penn.
*Paul Riefler, Inc., Hamburg, N. Y.
Rhode Island Cinder Block Co., Inc., North Providence, R. I.
Ruby Lumber Co., Madisonville, Ky.
Standard Block Co., Gulfport, Miss.
Stewart-Nattinger, Inc., Springfield, Mo.
*Southern Tier Concrete Products Co., Alfred, N. Y.
The Concrete Products Co. of Cape Cod, Inc., Falmouth, Mass.
*Western Concrete Products, Inc., Bismarck, N. D.
Zeidler Concrete Products Machinery Co., Clear Lake, Iowa

Concrete Coating

THE CAMP CO., INC., 6958 S. State St., Chicago 21, Ill., has announced a Latex Concrete Topping, for smoothing or patching concrete indoors or outdoors. The topping is said to be waterproof, grease and oil-resistant, and lactic acid-resistant. It is self-bonding, and takes on the color of concrete. For application, sweep loose scale or foreign material from the concrete; if very dusty, wash the surface to remove impregnated dirt, then mop any puddles. The topping may be applied to a clean, stable surface, whether damp or dry.

Association President

Carl Thompson of Thompson Concrete Products Co., Inc., Kenosha, Wis., has been elected president of the Wisconsin Concrete Products Association, succeeding Loyal Clark, Wausau Concrete Co., Wausau. A. W. Devos of the Devos Block Co., Milwaukee, was elected executive secretary and treasurer. Cecil Hemstock of Hemstock Bros. Concrete Products, Sparta, was named first vice-president, and Eugene Kleist, Fehr Concrete Products, Inc., Eau Claire, second vice-president.

Named Vice-President

WILLIAM J. BRULL has been named vice-president and general manager of the Zenith Concrete Products Co., Duluth, Minn., according to an announcement by Donald C. MacDonald, president. A native of Marshall, Minn., Mr. Brull formerly was vice-president and assistant general manager of Northwest Concrete Products Co., St. Cloud, Minn. He is a past-president of the Minnesota Concrete Products Association.

Heads Marble Cliff Firm

F. H. FRANK has been re-elected president of Marble Cliff Concrete Products Co., Columbus, Ohio, and N. C. Gorenstein has been renamed vice-president and general manager. Robert Gundersheimer, formerly vice-president in charge of production at Hackman Manufacturing Co., was appointed secretary, and Allen Gundersheimer was named chairman of the board.

Concrete Products Meeting

THE CONCRETE PRODUCTS ASSOCIATION OF WASHINGTON will hold its annual Spring Meeting March 15, 16, and 17, in Seattle, Wash. The morning of the 15th will be devoted to a general business meeting, with a session of the block manufacturers following in the afternoon. The 16th will again include general business, with general interest speeches in the afternoon. An informal dinner and dance will be held Friday evening, the 16th, and in the morning of the 17th, the pipe manufacturers will meet. The afternoon will be reserved for discussion of activities throughout the industry.

Canadian Concrete Plant

ANGLO-CANADIAN CEMENT LTD., Agincourt, Ont., Canada, a recently formed company, has started production at its ready-mixed concrete plant, costing about $500,000. The plant has a daily production of 600 cu. yd. of concrete. The firm is backed by Waller Investments, Toronto and London, England.

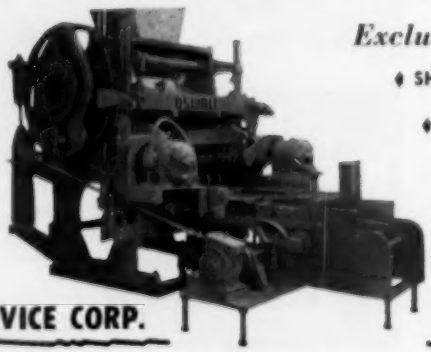
•

JAMES H. SCHOFNER has been appointed manager of the concrete block division of J. E. Evans Concrete Products, Inc., Shelbyville, Ind. Joining the company in 1947, Mr. Schofner has served as block plant foreman and superintendent.

Boosts Output ♦ OSWALT BLOCK MACHINE ♦ Without Sacrifice of Quality

Massive construction with full 2" thick stress-relieved frame, and all matching parts machined for precision fit.

GREATER STRENGTH AND STABILITY ♦
SMOOTH RELAXED OPERATION ♦
LONG SERVICE ♦
LOW MAINTENANCE ♦



Exclusive **OSWALT** *Features*

♦ SHOCK-FREE BLOCK EJECTOR
♦ FRONT-END PALLET FEEDER
♦ IMPROVED VIBRATION AND SPEED-UP

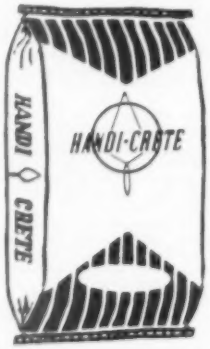
Write for new Brochure of OSWALT Model H, No. 55 Block Machine

OSWALT ENGINEERING SERVICE CORP.

1335 Circle Ave., Forest Park, Ill.
Phones: ESstebrook 8-4664, FOrest 6-2790

NOW AVAILABLE!

LICENSES for Manufacture and Distribution of



HANDI-CRETE

- DEHYDRATED
- PRE-MIXED
- PACKAGED
- CEMENT PRODUCTS

More than 20 million bags of packaged dehydrated materials for making concrete will be sold in 1956! Handi-Crete offers you everything you need to get your share of this profitable market. Territories are still open for exclusive manufacture of Handi-Crete. Some distributorships also available.

HANDI-CRETE

GET THE HANDI-CRETE STORY
Send for Booklet Today

Write: President

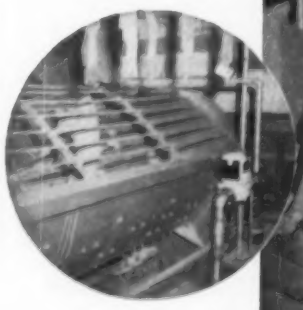
HANDI-CRETE, INC.

3105 Roswell Rd., N.E. Atlanta, Georgia

Improve moisture control, speed loading, save space with Neptune Auto-Stop water meters. Set by pushing buttons; meter cuts off automatically. Excellent reputation for sustained accuracy and trouble-free operation. *Ask for Bulletin 562 WRP*

NEPTUNE Automatic Water Meters...

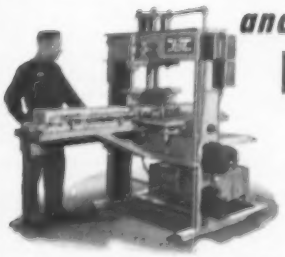
FOR READY-MIX PLANTS AND BLOCK PLANTS



NEPTUNE METER CO., 19 W. 50th St., New York 20
Branches and Distributors in Principal Cities

Give Customers Beautiful Split Block Like This—

made from Block produced on a Besser VIBRAPAC



and Split on a BES-STONE Block Splitter

Yes—split block *is* beautiful if it's made *right*, using a Besser Vibrapac and Bes-Stone Splitter—the combination that gives you NEW PROFIT OPPORTUNITIES plus SATISFIED CUSTOMERS. Get all the facts from your nearby Besser Representative, or write for literature to:

BESSER COMPANY
Complete Equipment for Concrete Block Plants
ALPENA, MICHIGAN, U.S.A.

WHERE TO BUY

Free For The Asking!

SMITHKO'S

NEW CEMENT COLOR CARD Showing 22 of our industry's strongest, distinctive shades. For nearly forty years our 65 limeproof colors have been the standards of comparison for all cement applications. Samples, technical brochure and quotations on request.

SMITH CHEMICAL & COLOR CO., INC.

53-57 JOHN ST. BROOKLYN 1, N.Y.

FOR SALE
PROFITABLE GROWING BUSINESS IN MIDWESTERN PENNSYLVANIA

- Complete Concrete Block Plant
  Operating 1951 Besser Super Vibrapac
  1,500,000 Annual Production
- Complete Ready Mix Concrete Plant
- Complete Crushing Plant new in 1953
  Universal 32" x 40" Impactor, bins, etc.

All above located on 17 acre tract including buildings and offices.
For further information contact—
W. K. NITTERHOUSE
NITTERHOUSE CONCRETE PRODUCTS
Phone: COlony 4-6154 CHAMBERSBURG, PENNSYLVANIA

MIDWESTERN CONCRETE EQUIPMENT CO.

FOR SALE — Fleming 180 with 4"6"8" Molds, Headers, Bull Nose Halves Sash etc. 40 Steel Racks, 12 ft. Stearns Mixer and 1500 pallets a complete setup for a small plant. Can be seen at Allison Block Co., Stanberry, Mo.

Fleming 180—W/4"6"8"12" Molds, Sash Halves etc.; 44 Steel Racks, 1400-10" Pallets. This machine is less than 2 years old, has pressure head and all the late features. In excellent condition, can be seen at Radcliff & Berry Concrete Products Co., Orleans, Indiana.

Fleming 180—With 4"8" Molds, 1000 Pallets; can be seen at Beatyville Concrete Products Co., Beatyville, Kentucky.

F. C. George 2 Block Model 400 with 4"8" Redi Furred Molds, Halves, Sash, Bull Nose etc.; 5000 Aluminum Pallets; 40 Steel Racks. Can be seen at the Vernon Country Block Co., Nevada, Mo.

Dunbrick Machine with Attachments to make 4x8 Brick, 8x8 Brick or 12x8 Brick; 5250 Steel Pallets; Racks for 5000 Bricks. Can be seen at Radcliff & Berry, Orleans, Ind.

Fleming 180—with Pressure Head, 4"8"12" Molds; 1200 Pallets. Can be seen at Boyle Block Co., Danville, Kentucky.

Columbia M8 with Offbearer; 2000 Steel Pallets; 80 Racks and Molds for complete line of Concrete Products. Can be seen at Miller Bros. Block Co., MaComb, Ill.

These Machines are all in very good shape and can be bought with small down payments.

1629 Venice Ave. Granite City, Ill.

FOR SALE

Two—one block Kent Blockmakers, 3 H.P., 220 volt, 3 phase.
Two—4 x 8 x 16 mold boxes to make both solid and hollow blocks.
Two—8 x 8 x 16 mold boxes.
One—8 x 12 x 16 mold box.
1300—8" pallets, some aluminum and some cast iron.
550—12" pallets, cast iron.
500—4" pallets, steel.
One—Kent Pallet Dunker.
One—Air compressor, 5 H.P., 220 volt Air-Flo.
28—Steel Racks.

Acme Block and Supply Co.

1306 Mackinaw Street Saginaw, Mich.

ANY REASONABLE TERMS CONSIDERED

FOR SALE

2 Block Lith-I-Bar Machine 1951 Model in good running condition with off-bearer. Practically rebuilt with spare parts. $4,200.00.

4", 6", 8", 12" and 2 types chimney block and brick attachments. New 8" and 12" cores never been used. Brick and 6" attachments used very little. $2,500.00.

2,000 18x18 pallets @ $1.30.

15 H.P. Scott Air Compressor $950.00.

Reason for selling, purchased three (3) block machine.

CALN BLOCK CO.

Caln R.D. #1 Coatesville, Pa.

USED LESS THAN MONTH

12 cu. ft. Link-Belt Mixer with motor and drive.
18" belt conveyor, 20'-6" oc with motor and drive.
Stump brick machine with 3 molds and ample plywood pallets.
5 HP 3 phase Westinghouse twin stage air compressor.
Platform lift truck, Presto hydraulic, electric, ½ ton.
Budgit hoist, ½ ton, 115 volt, with "A" frame.
2 Vibrating tables, with splash block, stepping stone, porch slab and curbing molds.
Multiple vibrating cradle with molds to make approx. 175 ft. of lintels per pour.

BUILDERS CONCRETE PRODUCTS, INC.

Old Peachtree Rd., Chamblee, Ga.

FOR SALE
CONCRETE EQUIPMENT

Koehring 16E Twin Batch Paver on Rubber—Serial 24723. Perfect Condition Age about 3 years. PRICE $12,500.00

Johnson, 4 Compartment Bin Batch w/27 cu. ft. Hopper on Legs—$700.00. Willis, 5 cu. yd. Weigh Batcher, 40' x 24' Conveyor, Water Tank, Complete Portable Concrete Setup—$3500.00

GERLACH BUILDERS SUPPLY, INC.

Topeka, Kansas Phone 3-3263

GOOD WILL BUILDERS

Your contractor and bricklayer customers will be able to do quicker, easier, straighter work with UB Tools . . . tools that carry YOUR OWN COMPANY ADVERTISING. Linestretchers, Corner Ties, Line Pins, Twigs, Concrete Calculators. We also wholesale a complete line of Blocklayers' Tools. Write for literature and prices.

UNITED BUILDERS
1822 Lindberg Dr., Muskegon, Mich.

FOR SALE BY OWNER

Rock Processing Plant for Concrete. Basalt, Pumice Pits. Pipe, Block, Brick Machines. Trucks. Loader. Hand Tools. Shop, Engineering, Office Equipment. Wholesale-Retail Yard. Residence. 22 furnished Apts. for help. Central heating plant. Utility Bldg. Beautiful yard. Fruit, Shade trees. Daily Milk, bakery, Mail service. No encumbrances. Property layout engineered for expansion. Our 14 yr. averages show $6000.00 per yr. income per employee. Located in hottest spot Pacific N.W. Established 1939. Suitable for group that wants to be together.

BOX O-21, CONCRETE PRODUCTS
79 W. Monroe St. Chicago 3, Ill.

PRICED FOR QUICK SALE

As we have purchased larger Stearns equipment, we have the following good used equipment for immediate sale:

1—COLUMBIA, Model 8, automatic, two block machine
1,500—½" x 18" x 18" plain steel pallets
1—18 cu. ft. BESSER mixer
1—18 cu. ft. BESSER skip loader
1—8"x8"x16", 2-CORE TYPE MOLD, complete
1—8"x6"x16", 2-CORE TYPE MOLD, complete
1—8"x4"x16", 2-CORE TYPE MOLD, complete
1—8" x 8" x 8", MOLD, complete
1—Pallet cleaner and oiler.

This equipment is in good condition and can be seen in operation.

PARRISH FRUIT COMPANY

467 North Spring Garden De Land, Fla.

COLORS *For Cement and Concrete*

COLOR YOUR CONCRETE WITH LANSCO CEMENT COLORS, available in 40 ATTRACTIVE shades. Suitable for all types of concrete products. Write for our new color card, copy of "Suggestions For Using Cement Colors", and for free samples and price list.

Manufactured by:

Landers-Segal Color Co.

73 Delavan St. • Brooklyn 31, N. Y.

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1 Van-O-Matic Plain Pallet, two blocks at a time machine, with attachments to make:

12", 8", 4" Blocks
6", 4" Solid Blocks
8 x 8 Chimney Block

800 Pallets
30 Racks
1 12 cubic foot Mixer
1 30 foot Belt Conveyor

MAZUR BLOCK CO.

Wauregan, Conn.

ALSO SEE WHERE TO BUY ADVERTISING ON OTHER EQUIPMENT IN ROCK PRODUCTS' GENERAL SECTION

LITH-I-BAR, L-3, Two Block Machine, complete.
Air Compressor and Off-Bearer.
With the following molds:
1—8x8x16 Regular Block with Accessories to make BN, Sash, Half, etc.
1—4x8x16 Regular Block
1—8x8x16 Header Block
1—12x8x16 Regular Block with Accessories for BN, Sash, Half, etc.

Terms Available

RED-E-MIXED CONCRETE COMPANY
14th and Pacific — Atchison, Kansas
Phone: 143

CONCRETE PRODUCTS PLANT FOR SALE OR LEASE

Located in County Seat in thriving industrial and farming community. Equipment includes Fleming 180 with 4-6-8-10 inch molds, 12 ft. Fleming mixer, skip hoist, 10 h.p. boiler, Barret lift truck, plenty of racks and pallets. Champion drain tile machine, 66 Jaeger mixer and forms for cast products. Two ton 1954 International truck.

Franchises and well established trade for metal building products and other related materials.

Price, for quick sale, including inventory and real estate, $18,000. Terms available to right party.

Experienced operator can lease. Good opportunity for hard worker with business acumen, now working for wages.

SMITH CONCRETE PRODUCTS
Junction Highways 61 & 32
Ste. Genevieve, Missouri

ELECTRIC MOTOR TRUCK WITH BATTERY AND CHARGER IN GOOD CONDITION.
PRICE $300.00
FORTRESS CONCRETE PRODUCTS
15th and Main Street — Melrose Park, Ill.

USED COLUMBIA MACHINES
Reconditioned Model #8 ..... $6,000.00
Factory Rebuilt Model #8 ..... 8,000.00
All Prices Quoted F.O.B.
COLUMBIA MACHINE
14th & Washington Streets — Mattoon, Ill.

FOR SALE
1—#9 Riddell Dry Pan
Cinder Grinder.
Capacity 30 tons per hour.
BOX O-12
CONCRETE PRODUCTS
79 W. Monroe St., Chicago 3, Ill.

FOR SALE
Hetzel Ready Mix Concrete Plant 750 bbls Cement bin complete with screw, elevator and weight batcher. 45 Ton 3 compartment aggregate bin with weigh batcher.
Contact — Box 1522
Durham, N. C.

WANTED
30 or 40 Good steel Racks for cored Pallets, also Truckman Lift truck for handling same.
PAUL B. DUTTON
Northfield, Vt. — Phone 6841 Nights

LOWER COST
packer-head wings
Proved to last as long or longer — yet cost considerably less. Write for prices.
TEXAS FOUNDRIES
LUFKIN, TEXAS

PRICED FOR QUICK SALE

As we have purchased larger Stearns equipment, we have the following good used equipment for immediate sale:
1—Stearns Zipper (semiautomatic), serial No. Z-49.
1—Stearns 18 cu. ft. mixer with V-belt drive.
1—Pallet oiler.
44—Racks.
1—4" ATTACHMENT.
950—4" cored steel pallets, Code ZONAL.
1,120—4" steel plate pallets (for 4" solids).
1—8" ATTACHMENT.
1,325—8" regular, cored steel pallets, Code DRAM.
150—8" double corner, cored steel pallets, Code DRESS.
100—8" regular sash, cored steel pallets, Code DROSS.
100—8" single bull nose, cored steel pallets, Code LADLE.
100—8" single bull nose sash, cored steel pallets, Code LYCON.
100—8" double bull nose sash, cored steel pallets, code LOBBY.
1—10" ATTACHMENT.
540—10" regular, cored steel pallets, Code FUNGUS.
80—10" double corner, cored steel pallets, Code FORTRESS.

BYRUM BLOCK COMPANY
2230 Hill St. — Anderson, Ind.

1—#9 Jolterete (Dual Vibration) complete with motors & controls. Attachments for 8" & 12" Blocks with modular Pallets, 50% air space.
Also a good supply of spare parts.
1—Champian Drain Tile Machine.
Above equipment is in good condition.

WEYMOUTH CONCRETE BLOCK CO.
197 Lake St. — East Weymouth, Mass.

CONCRETE BRICK COLORS
CEMENT COLORS
MORTAR COLORS
made by
BLUE RIDGE TALC CO., INC.
Henry, Virginia

FOR SALE
Dunbrik Machine in good condition with pallets and racks for making 9000 brick per day. 2 sixteen cu. ft. overhead Dunn mixers complete with skiphoists. One Bucyrus-Erie dragline ½ yd. crawler. ½ yd. material handling bucket. One Rudimatic tagline wheel.
BAILEY DUNBRIK CO.
360 N. San Marco Ave. — P.O. Drawer 589
St. Augustine, Fla.

FOR SALE
Fork and platform power lift trucks, used and guaranteed factory rebuilts.
ERICKSON POWER LIFT TRUCKS, INC.
Saint Anthony Blvd. & University Ave. N.E.
MINNEAPOLIS 18, MINNESOTA
Phone—Sterling 1-9508

WANTED
One Kirk & Blum
Joist making table.
W. N. RUSSELL & CO.
34-60 Albertson Ave. — Westmont 7, N.J.

Small Block Plant Owner
I have quite a supply of used machines that are replaced by larger plants who need larger production. Some of these setups are in very good condition. As they are a surplus to me, I will sell on any reasonable terms with payments as low as $50.00 a month.
Mid-Western Concrete Equipment Co.
Box 646 — Mukwonago, Wis.

FOR SALE
Skip hoist, also Kelly mixer 40 cu. ft. capacity, and bucket elevator approximately 30 cu. ft. Good condition.
FAIRVIEW BLOCK CO., INC.
68 Violet Ave., Poughkeepsie, N.Y., Phone 1777

SWAP — SELL — BUY
BLOCK MACHINES

Stearns #7 & 9 Joltcretes ... $500.00 each
(Jolterete owners at this price buy one for spare parts.)
Mold Boxes #7 & 9 ..... 150.00 each
1—Monroe 28 Cu. ft. Concrete Mixer 995.00
1—George 28 Cu. ft. Concrete Mixer 750.00
1—Continuous Mixer 150.00
2—Air Offbearers Stearns #7 & 9 ..... 250.00 each
1—Truckman Lift Truck (excellent condition) 500.00
2—Hand Lift Trucks ..... 175.00 each
1—18 cu. ft. Stearns Mixer complete with 10 H.P. motor 650.00
100—Racks for cored steel pallets ..... 10.00 each
100,000 pressed steel pallets in stock
(Send tracing or sample for quotation).

WRITE ● WIRE ● PHONE
Mr. Flowers

Send in list of equipment you need. If we don't have it in stock, we usually know where we can find it at a bargain.

GENERAL ENGINES CO., INC.
Route 130 — Therefore, N.J.
Phone: Tilden 5-5400

GERSON'S GOOD WILL BUILDERS
Advertising necessities for the block industry. Line Pins, Twigs, Corner Blocks, Calculators. Complete catalog on request.
GERSON CO.
82 Deering Rd. — Mattapan, Mass.

WANTED
Distributor or manufacturer's representative to handle complete line of concrete products machinery, protected territories, generous commission.
BOX O-4, CONCRETE PRODUCTS
79 W. Monroe St. — Chicago 3, Ill.

unbreakable
PALLET RINGS
Write for full information
TEXAS FOUNDRIES
LUFKIN, TEXAS

Superintendent Wanted By Concrete Products Plant In New York Area.
Box O-19, CONCRETE PRODUCTS
79 W. Monroe St. Chicago 3, Ill.

FOR SALE
#9 JOLT CRETE—3 AT A TIME
4000 8" Equiv. A DAY Excellent condition. 8" & 12" attachments with approx. 4000 8" & 2700 12" pallets. Approx. 100 Chase block cars, transfer cars, rail and turntable. Many spare parts for machine included. ALSO a complete drag line with 75 H.P. motor.
NASSAU CONCRETE PRODUCTS CO., INC.
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Lot of 3, 5, 7½, 10, 15 & 25 HP G. E. Motors all 3/60/440 v. open, sleeve bearings. Speeds 720 to 1200, all type KT. Perfect condition, reasonable.
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12"—10" and 4" used mold boxes for Stearns Zipper block machine.
OSAKIS SILO CO.
Osakis, Minnesota

Quality Block + Quality Walls...

Your assurance of continued success

Building a successful concrete masonry business hinges on steadfast adherence to two practices:

1. Make block that comply with applicable specifications for strength, dryness and absorption.

2. Make sure your block produce quality walls —and floors. *The final customer buys walls and floors, not block.* He judges block on the basis of how they perform in the wall or floor.

Making quality block is your job. Making sure your block become quality walls is just as important to your success.

That's why most successful producers work with architects and builders to encourage good workmanship. They regularly visit jobs on which their block are being used to see that the principles of quality construction are being observed.

Quality block, plus quality walls and floors, are your best salesmen for future business. Send for a free copy of *"Concrete Masonry Handbook,"* which contains recommended construction practices. It is distributed only in U. S. and Canada.

PORTLAND CEMENT ASSOCIATION
Dept. 3-45, 33 West Grand Avenue, Chicago 10, Illinois
A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

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Now - You Can Also Make BATTER Block on Your VIBRAPAC!

Cone has four courses of irregular 7½" high batter block. Except for the base, balance of structure forms a cylinder made of barrel block.

New Source of Revenue for Progressive Block Plants

For the first time in the history of the Concrete Products Industry, you can make odd-shaped batter block, on a production basis, with the same speed as conventional block. The versatility of a Besser Vibrapac — *the world-famous concrete block machine* — makes this possible.

The Besser Vibrapac has always made barrel block for manholes. Now — you can also make the irregular batter block for building the cone. A standard Vibrapac machine, plus Plain Pallets, replaces the extremely slow and laborious old-fashioned method of tamping these irregular units by hand.

In practically every state, concrete block is now standard material for the construction of Catch Basins and Manholes, effecting considerable savings in both labor and materials. Why not cash in on the big demand for barrel and batter block? Let us show you how you can adapt your Vibrapac machine for this new market. Write for Bulletin No. 112.

Vibrapac attachments for making first and second courses of batter block cone. Stripper head shown in position above mold.

Mold insert and stripper head plungers for making third and fourth courses of batter block cone.

Close-up view of Besser Vibrapac making two irregular batter block on a Plain Pallet. Note the steady flow of these units. You get the same mass production method as regular block.

BESSER COMPANY

BOX 135 • ALPENA, MICHIGAN, U. S. A.

Complete Equipment for Concrete Block Plants

A 8564-1PBC

Moving Day
is no problem with
TRAVEL BATCHER

TRADEMARK

The hopper can be recharged with either a dump truck or a front-end loader, and can be used with 3-, 4-, or 5-yard mixers.

MOVING DAY is no problem with the new on the job TRAVEL BATCHER. Instant maneuverability makes the TRAVEL BATCHER available for several jobs a day, and its speed of operation results in the production of up to 100 yards per hour.

Batch mixture is maintained uniformly with accurate scales mounted on the machine. By bringing the batch plant closer to the job, it reduces the number of truck mixers needed by as much as 83%.

The TRAVEL BATCHER offers the performance of a stationary batch plant, plus the convenience of mobility.

TRAVEL BATCHERS are being used by the largest contractors on Bureau of Reclamation projects, Army Air Force, Navy and Marine installations, Atomic Energy projects, Defence Projects in Alaska, Royal Canadian Air Force Stations in Canada, and on many government and state highway projects.

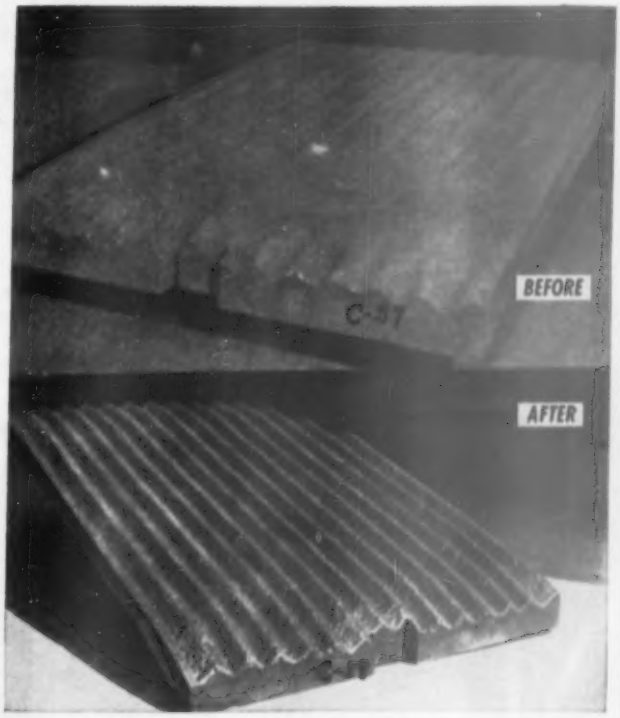
For additional list of users, for more information and letters of recommendation, write, wire or phone . . .

SOUTHEAST READY-MIX
6450 Holladay Blvd. • Salt Lake City, Utah

Rebuild Your Crusher Plates with two-tone Manga-tone N.M.

Does it make sense to throw away 90% of a manganese plate, just because the rock-producing corrugations are gone? It isn't necessary any more — in fact, it is sheer waste. Your crusher plates can be rebuilt economically with TWO-TONE MANGA-TONE N.M. in any regular Two-Tone Shop. THEY WILL LAST LONGER THAN NEW PLATES. They will fit your crusher "like a die." Every plate guaranteed.

This is an actual unretouched photograph. See how perfectly the plate has been rebuilt. Call in our field man and let us rebuild one for you.

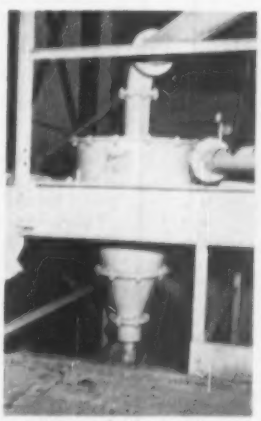


THE RESISTO-LOY CO., INC., Mfrs. . Grand Rapids 7, Michigan

Furnishes a positive seal for round flexible joints. Used by leading dredging and hydraulic sand-and-gravel operators, and the U. S. Engineering Corps. This Multi-use chain sleeve clamp is easy to apply . . . positive in action. Write for illustrated folder, today.

THE BLACK BROTHERS CO., INC., 505 9th Ave., Mendota, Illinois

25" DURACLONE
RECOVERS 8 TONS OF SAND PER HOUR



Installation of 25" Duraclone at California Materials Company plant, Sunland, California.

Designed to recover fine sand from the overflows of washers, the Duraclone keeps sand ranging from minus 30 to plus 200 mesh from the waste ponds, thus enabling producers to meet the most exacting specifications.

A 25" Duraclone in the sand circuit will handle a volume of 700 gpm from the classifier overflows, extracting from 5 to 8 tons of clean fines per hour.

A 4" sand pump, running at about 1400 rpm, and powered by a 20 hp motor, forces the feed to a rubber-lined cone at approximately 18 psi.

ANALYSIS OF FINE SAND RECOVERY

	% RETAINED	% PASSING
30M	8.7	91.3
50M	63.2	36.8
100M	89.6	10.4
200M	97.7	2.3

FOR COMPLETE INFORMATION WRITE TO

H. B. LARGE ENGINEERING COMPANY

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Phone SYcamore- 2-7820

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WILFLEY centrifugal PUMPS

Have You Seen the AGIPELLER ?

NEW!
INCREASES OUTPUT!
CUTS COSTS!

THIS SUCTION DREDGE AGITATOR (Pat. Pend.) keeps nozzle clean, loosens compacted deposits, crushes oversized stones. Pays for itself quickly. Write for free bulletin. *Trade mark

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Dredge and Pump Engineers

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NEW RUBBER CONVEYOR BELTING

Save up to 25%

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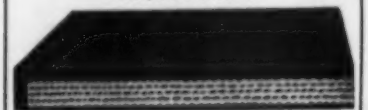

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom rubber cover. 18# to 19# average friction pull, 2500# to 3000# average cover tensile belting. For more severe service, high tonnages and abrasion resistant. For handling stone, mineral ores, concrete, cement, coal and other similar materials, both wet and dry. Belt has molded rubber edge.

Width	Ply	List Price	Sale Price
18"	4	$5.69 foot	$3.72 foot
20"	4	5.37 foot	4.03 foot
24"	4	6.56 foot	4.89 foot
30"	4	8.05 foot	5.89 foot
24"	5	7.68 foot	5.61 foot

Additional widths and plies available at low prices. Write for Free Samples.

MINERAL PROCESSING EQUIPMENT CORPORATION
2185 S. THIRD ST. COLUMBUS 7, OHIO
Phones: HI. 4-2187 Days AM. 1-2313 Eves.

Kilns—Coolers—Dryers

8' x 125' x 5/8" shell.
7' x 110' x 5/8" shell.
5' x 20' x 1/4" welded.
6' x 10-Hearth Furnace.
310-12 Link-Belt Roto Louvre.
502-20 Link-Belt Roto Louvre.
1106—36 Link-Belt Roto Louvre.

Elevators

57' c/c 10x6' buckets on chain. 5 HP.
52' c/c 5x5 buckets on 6" belt.
50' c/c 8x5 buckets, complete.
32' c/c 6x4 buckets on 7" belt.
26' c/c 8x6 buckets, steel case.

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Hardinge 10'x48". 6'x48".
Patterson 6'x8' Ball Mills (2 avail.).
Allis-Chalmers 5'x10' Rod Mill.
Allis-Chalmers 6'x22' Tube Mill.

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Tyler 4 x 7 with thermionic unit.
Tyler—5 x 12, 3 x 10 wet type.
Robinson Gyro Sifter 28A.
Gayco, 8'-5'-18" all with motor drives.

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625 CFM Worth. Compressor 14x12.
2100 CFM Sullivan Compressor WN4.
8' x 10' Oliver Rotary Filter.
8' x 12' Feine Rotary Filter.
250 HP B.&W. Stirling Boilers.
150 HP Union W.T. Boilers.
47' Conveyor 12" Screw, 2 HP motor.

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Murray Hill 7-5280
[Machinery and Equipment Merchants]

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60"x48" to 6"x3"
New and used RELIABLE

B&P "Farrel-Bacon" Jaw Crushers

BACON-PIETSCH CO., INC.
26 Park St., Montclair, N. J.
29 Washington Ave., Hamden, Conn.

FOR SALE

3—Bucyrus-Erie 27T Blast Hole Drills. 2 Diesel and 1 electric.

1—Bucyrus-Erie #8 Bit Dresser. Also 6" tools for above.

8—Used Seco screen 4'x8' and 4'x10'.

DOLOMITE PRODUCTS CO., INC.
1218 Granite Building Rochester 4, N.Y.

ALSO SEE READY-MIXED CONCRETE AND CONCRETE PRODUCTS EQUIPMENT WHERE TO BUY ADVERTISING IN CONCRETE PRODUCTS SECTION

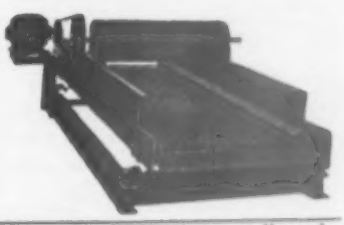
BONDED EQUIPMENT BARGAINS

IMMEDIATE SHIPMENT FROM OUR FACTORY — WRITE, WIRE OR PHONE

NEW BONDED® HEAVY DUTY VIBRATING SCREENS

Model Number	Screening Area	No. of Decks	Sale Price
124AS	2′ x 4′	1	$ 355
224AS	2′ x 4′	2	375
126AS	2′ x 6′	1	375
226AS	2′ x 6′	2	395
136AS	3′ x 6′	1	495
236AS	3′ x 6′	2	585
336AS	3′ x 6′	3	815
138AS	3′ x 8′	1	575
238AS	3′ x 8′	2	695
338AS	3′ x 8′	3	845
138BS	3′ x 8′	1	1119
238BS	3′ x 8′	2	1165
338BS	3′ x 8′	3	1250
248BS	4′ x 8′	2	1695
348BS	4′ x 8′	3	1850
2410BS	4′ x 10′	2	1775
3410BS	4′ x 10′	3	2095
3412BS	4′ x 12′	3	2395

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry. HEAVY DUTY MODELS, TYPE BS: 4-bearing positive throw, eccentric shaft; 3′ x 8′ to 5′ x 14′, 1 to 5 decks. GENERAL DUTY SCREENS, TYPE AS: eccentric weight mechanism, spring mounted, 1 to 3 decks, 2′ x 4′ to 3′ x 8′. Write for new 8-page Bulletins 1086 and 1087.

BONDED CARRIES LARGE STOCKS OF SCREEN CLOTH FOR IMMEDIATE SHIPMENT

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS listed, with conveyor belting in two pieces. Conveyors are equipped with 5″ roll diam. idlers and return rolls 20″ diam. head pulley and 16″ diam. tail pulley mounted on 2¼″ or 2-7/16″ diam. shaft. Belt is new 4-ply, 28-oz. duck, ⅛″ top rubber cover x 1/32″ bottom cover and is fresh stock made by leading manufacturers.

Remember, You Save Up To 50%

CONVEYOR PRICES INCLUDE BELTING

Belt Width	Length of Conveyor	List Price	Sale Price
14″	25′	$1166	$ 672
14″	50′	2016	1064
14″	85′	3206	1612
16″	20′	1083	592
16″	45′	1928	1012
16″	60′	2494	1264
18″	25′	1327	739
18″	45′	1986	1085
18″	85′	3466	1798
18″	100′	4001	2065
20″	25′	1366	770
20″	60′	2762	1426
20″	90′	3959	1995
24″	25′	1428	835
24″	45′	2227	1237
24″	70′	3226	1744
24″	100′	4425	2339
30″	50′	2669	1504
30″	70′	3576	1971
30″	90′	4483	2432
36″	25′	1632	1040
36″	45′	2492	1561
36″	60′	3327	1950
36″	100′	5102	2990

For conveyors longer or shorter than those listed above, add or deduct the following per foot prices according to belt width. Prices include belting.

For 14″ belt.....$15.66 per foot
For 16″ belt..... 16.78 per foot
For 18″ belt..... 17.90 per foot
For 20″ belt..... 18.95 per foot
For 24″ belt..... 20.66 per foot
For 30″ belt..... 23.02 per foot
For 36″ belt..... 26.00 per foot

NEW CONVEYOR BELTING SAVE UP TO 25%

Heavy duty 4-ply, 28 oz. duck, ¼″ top rubber cover x 1/32″ bottom cover, 12# to 15# average friction pull, 800# to 1000# average cover tensile rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.

Width	List Price	Sale Price
14″	$3.43 foot	$2.75 foot
16″	3.86 foot	2.88 foot
18″	4.27 foot	3.19 foot
20″	4.69 foot	3.69 foot
24″	5.55 foot	4.14 foot
30″	6.77 foot	5.06 foot
36″	8.01 foot	6.00 foot

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛″ top rubber cover x 1/32″ bottom rubber cover, 16# to 19# average friction pull, 2500# to 3000# average cover tensile belting. For more severe service, high tonnages and abrasion resistant. For handling stone, mineral ores, concrete, cement, coal and other similar materials, both wet and dry. Belt has a molded rubber edge.

Width	Ply	List Price	Sale Price
18″	4	$5.09 foot	$3.72 foot
20″	4	5.57 foot	4.03 foot
24″	4	6.56 foot	4.80 foot
30″	4	8.05 foot	5.89 foot
24″	5	7.48 foot	5.61 foot

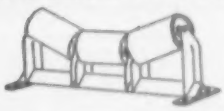
Additional widths and plies available at low prices. Write for Free Sample.

NEW BONDED GEAR REDUCERS

H.P. At 20:1 Ratio	H.P. At 30:1 Ratio	Price
3	2	$ 81
5	3	142
10	7½	228
15	10	286
20	15	394
25	20	468
30	25	575
40	30	750
60	50	925

Reducers are right angle with worm on bottom (underdriven) and all models are fan cooled by means of a radial fan. Reducer will operate in either direction. Other sizes and ratios available at bargain prices.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5″ diameter Troughing Idlers for:

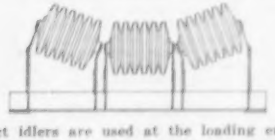
14″ belt	$17.25	24″ belt	$19.75
16″ belt	18.00	30″ belt	20.50
18″ belt	19.00	36″ belt	21.25
20″ belt	19.25	48″ belt	23.75

1-roll, 5″ diameter Return Idlers for:

14″ belt	$6.75	24″ belt	$ 8.00
16″ belt	7.00	30″ belt	8.75
18″ belt	7.50	36″ belt	9.25
20″ belt	7.75	48″ belt	10.75

All steel. Interchangeable with other well-known makes. Furnished with easily replaceable pre-lubricated Sealed ball bearings. Also can be furnished with greasable type Alemite Fitted bearings. Maintenance is negligible.

NEW BONDED RUBBER DISC IMPACT IDLERS



Impact idlers are used at the loading end or transfer points of troughing idler conveyors to absorb shock of heavy material falling on belt, thus reducing damage to belt. This cuts production costs and extends belt life. Rolls are made of a series of specially designed impact absorbing rubber discs mounted on steel tubing with easily replaceable sealed ball bearings. Also can be furnished with greasable type alemite fitted bearings. Interchangeable with Bonded standard idlers and other well known makes. Flat and return belt impact idlers available on application.

14″ belt.....	$58.00	24″ belt.....	$100.00
16″ belt.....	69.00	30″ belt.....	116.00
18″ belt.....	80.00	36″ belt.....	130.00
20″ belt.....	90.00	48″ belt.....	172.00

Bonded makes a full line of conveyor parts, accessories and parts to build your own conveyors. Write for Bulletin #1128 and/or Bulletin #938 on Feeders.

VISIT THE BONDED FACTORY ANY TIME — BONDED MACHINES AVAILABLE ON TIME PAYMENT PLAN

BONDED SCALE AND MACHINE COMPANY

PHONE: Hickory 4-2186 Days; 128 BELLVIEW

WRITE FOR FREE CATALOG AND PRICES

Mfgrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders

PHONE: AXminster 1-2213 Evenings COLUMBUS 7, OHIO

QUARRY EQUIPMENT

Pioneer 3042 primary crushing unit with feeder, etc. Good.
Cedarapids 3240 primary crusher. New Condition.
Cedarapids BBB 1036 jaw crusher scalping unit.
Cedarapids Model CCC 4024 Secondary roll unit.
Cedarapids 4033 hammermill secondary unit. Rebuilt.
Cedarapids 4033 hammermill. Rebuilt.
Cedarapids 2033 hammermill. Excellent.
Williams 20" x 30" Type NF hammermill pulverizer. Excellent condition.
Austin-Western 15x24 jaw. Excellent.
Cedarapids 42" x 10' apron feeder.
Cedarapids 4' x 12' double deck screen. Rebuilt.
Hewitt-Robbins 4' x 9' TD gyrex. Reconditioned.
New Holland 4-deck 4' x 12' vibrating screen.
Niagara 5' x 12' triple deck screen.
Cedarapids 3' x 8' double deck screen.
15 cu. yd. Cedarapids sand drag. New.
New 12" x 35' inclined open elevator.
60-ton, 2-comp., 8' x 15' storage bin with clam gates.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also belting.
18" dia. x 20" face magnetic pulley.
48" Telsmith Sand Tank. New.

SHOVELS AND CRANES

Lorain 820, 2-yd. diesel shovel, crane, drag. Reconditioned.
Lima Model 34 Paymaster GM3-71 diesel.
Lorain MC-414 20-ton truck crane. Excellent.
Lima 34 Paymaster diesel shovel.
Lorain TL 20 4x2 self propelled. Excellent.
Speeder Model 60 Shovel, Hoe, Clam.
Lorain TL20, 6x4, 15-ton truck crane.
Lorain MC3, 6x4, 11-ton crane.
Unit Model 614 diesel backhoe. Good.
Unit Model 514 Gas backhoe. Good.

TRACTOR, TRUCK, SCRAPERS, ETC.

8—Euclid rear dumps, 22 ton. Good condition.
3—Cat DW10 scrapers. Good condition.
1—Cat D-7 with bulldozer blade.
1—Allis-Chalmers HD-19 crawler with Carco blade.
1—Allis-Chalmers HD-10 with Baker bulldozer.
1—Int. TD-18 with Bucyrus-Erie bulldozer blade.
1—Int. TD9 w/front shovel attachment. Reconditioned.
1—Woodridge 15-18 yd. Model TCR scraper.

DIESEL POWER UNITS

Caterpillar D7700, 68 H.P. @ 1000 RPM. Rebuilt.
Caterpillar D13000 6-cyl. diesel engine, Twin Disc clutch, extended shaft, outboard bearing, 145 H.P. @ 1000 RPM. Rebuilt.
Caterpillar D17000 8-cyl. diesel engine with Twin Disc clutch, 190 H.P. @ 1000 RPM.
GMC 6-71 diesel engine radiator to and including clutch, 180 HP @ 1600 RPM. constant duty, electric starting equipment. New condition.
GMC 12-cyl. twin diesel engine complete from radiator to and including automotive type clutch with gear reduction unit, fabricated base, electric starting system, 360 H.P. @ 1200 RPM. New Condition.

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500 Cu. ft. Gardner-Denver diesel, rebuilt.
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Dragline equipment for Bucyrus-Erie 120-B with 90 foot boom, boom and hoisting machinery, etc., and 5 yard dragline bucket.
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2—Allis Chalmers 10" Superior McCully.
1—Allis Chalmers k-9 Gates Gyratory.
10—Jaw Crushers 5"x6" to 42"x48".
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3—Patterson 6'x8' Ball Mills.
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1—Williams #20 H.O. Slugger Hammermill.
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No. 3 up to No. 12 Gyratory Crushers.

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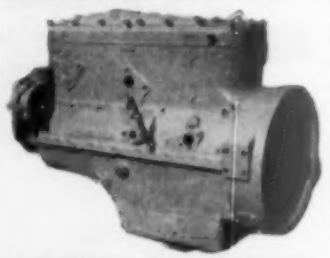

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1 Deister 3' x 8' 4 deck vibrating screen complete. Ready to work motor, drive discharge chutes, screen cloth and extra parts. Excellent condition. Price $2,000 f.o.b.
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Koehring 605 Shovel-Crane-Dragline Cat. D13000.

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JAW: Acme 10x20, 14x26, 14x28, 10x42, 16x32, 18x35, 20x40. Eagle 20x36. Diamond 20x29". Cedar Rapids 10x20, 20x36, 30x46. Farrell 10x20, 18x30, 14x36, 18x36, 36x48. Buchanan 30x42. Good Roads Reliance 15x30. Traylor 18x36, 24x36. Allis-Chalmers 30x18. Good Roads 10x20. Telsmith 18x22. Traylor 48x60, 42x48. Allis-Chalmers 42x40.
GYRATORY: Al-Chal 322, 6", 7½", 8, 9, 9K, 10, 20, 20 and 26" Telsmith 6B, 18" Interone, 36" Gyrasphere; Kennedy Van Saun 7, 18, 25½-S, 37½, 38; Traylor TY 1'6", 36", 4' Type TS.
ROLL: Cedar Rapids 40x20. Poineer 40x32. Pioneer 30x18. Telsmith 24x16. Pioneer 30"x18". New Holland 24x16. Pioneer triple 40"x22" A-C 42"x16".
HAMMERMILL: Nine 4 Williams Jumbo. Pennsylvania 8K25, 25x22. Cedar Rapids 20x33. Jeffrey 36x42, 36x24, 36x40. Penn RXH-100. Cedar Rapids 30x33. Cedar Rapids 50-50.
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Cedar Rapids Portable Super Tandem, excellent.
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Conveyco 4'x10' sand-dewatering pump and motor.
Dorr 5'x20' Rake type.
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Johnson concrete plant 333 yds. 5 aggr. compt.
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10" Portable Diesel powered. Complete.
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Telsmith 5'x12' dbl. deck elec. motor.
Cedar Rapids 4'x12' dbl. deck elec. motor.
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1—24" Cone Crusher
1—20 x 24 New Holland Roll Crusher
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1—10-30 Good Roads Jaw Crusher

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American #135A Hammermill
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Barber-Greene 12" Bucket Loader
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Apron Feeder 18" x 5½'
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Deister Plato D.D. Screen 4 x 6
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Two (2) Bucyrus Erie 27-T Churn Drills, used but in good condition.
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Above drills electric motor driven, crawler mounted.
Large quantity of bits, drilling tools and spare parts.
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3 10" McCully Gyratory Crushers
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2 Traylor 8" Gyratory Crushers
1 New RCA Metal Detector 10"x36" aperture
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GYRATORIES 5" up to 36"—JAWS 9 x 36 up to 84 x 66—ROLLS 24 x 16 to 54 x 24—HAMMERMILLS 36 x 36 Jeffrey, 36 x 36 Dixie, #30 Williams Slugger—PLANTS Pioneer 305-W & Cedar Rapids, Jr. washing, 1836 & 2436 port. primaries, Cedar Rapids 2225, two unit port. with 1824 jaw & 1624 roll, Jr. tandem, Pioneer 34 special, 3042 primary, 40 x 24 port. roll—MILLS 5 x 10 & 5 x 14 rod & ball—5½ x 22 tube—10' x 48", #36 & #66 Marcy, A-C 6' x 22' compeb ball—LOCOMOTIVES 20, 44, 65, 80, 100 tons standard—85 ton trolley locomotives — American Revolver crane model R-16—1300 cfm I-R PRE-3 compressor—Wemco #3 heavy media separation mill—42" x 12' feeder—600 hp & 850 hp single drum hoists—KILNS & DRYERS 8 x 123, 7 x 110, 10 x 100—Cedar Rapids double impeller impact breaker—SHOVELS-DRAGS B.E. 120-B, 110-B, 54-B—P & H 955 & 1055—N.W. 80-D, 78-D, 6—Lorain 820—Manitowoc 4560—Marion 111M, 7200, 7400—5 x 18 paddle-screw washer. Many other items.

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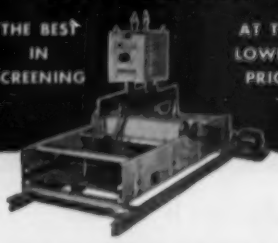

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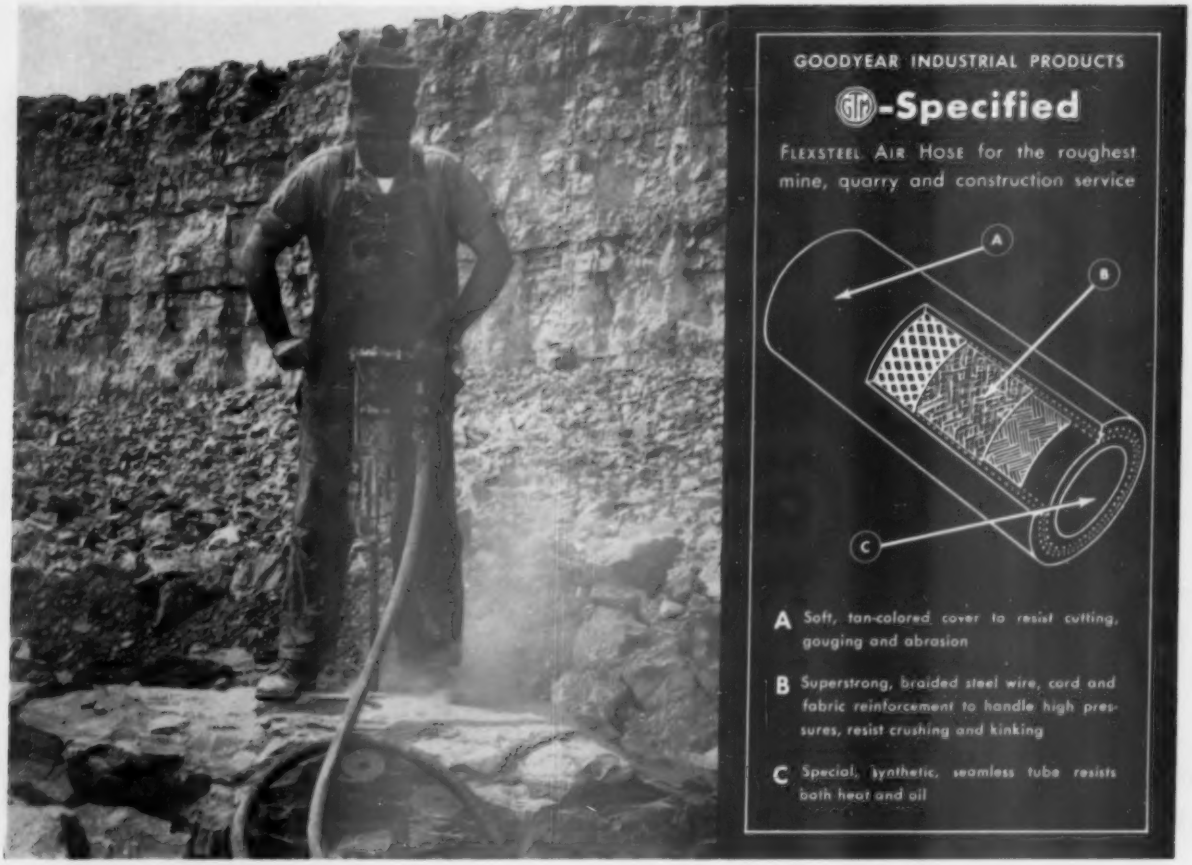
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